Vol. 940 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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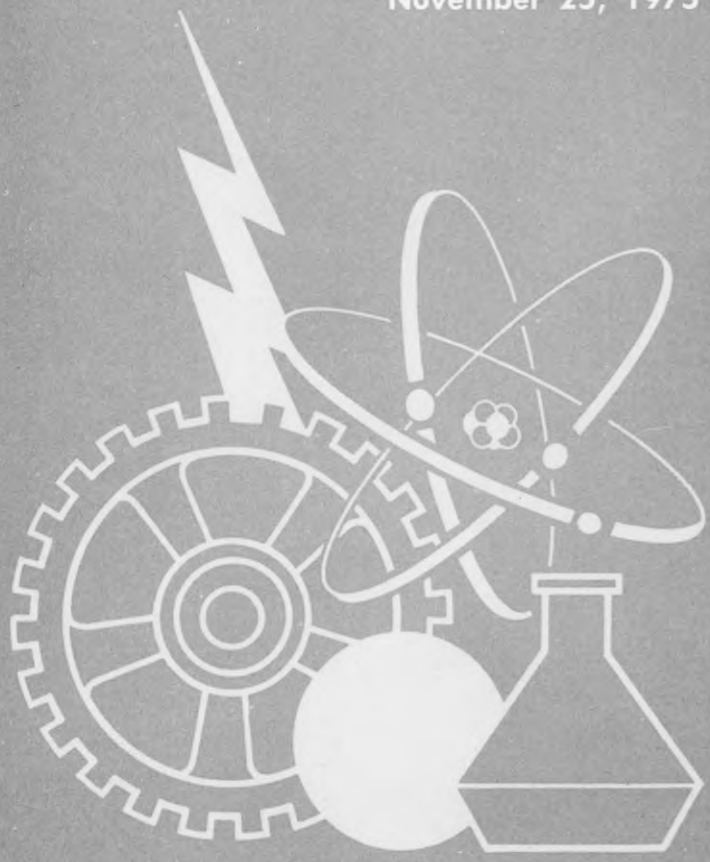
PATENTS

November 25, 1975



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

November 25, 1975 Volume 940 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Availability of U.S. Patent Reclassification Microfilm

(Patent and Trademark Office Publication PAT 031.1–7502–M)

The Patent and Trademark Office announces the availability of the microfilm publication "Reclassification Transfer Records" for Reclassification Order Number 416, dated February 28, 1975.

This publication lists all the patent classification changes which were effected in that reclassification.

The microfilm provides original and cross-reference transaction records from old classification to new classification in all three of the following sequences:

1. New class/subclass order
2. Patent number order
3. Old class/subclass order

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Oct. 24, 1975.

ALFRED C. MARMOR,
Administrator for Documentation.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,729,551, C. C. Cohn, SURFACE TREATMENT OF ALUMINUM AND ITS ALLOYS, **filed** Aug. 15, 1974, D.C., N.D. Ohio (Youngstown), Doc. C–74–185–Y, *Charles C. Cohn et al.* v. *F. A. Pilgrim Extrusions, Inc.* **Same, filed** Nov. 5, 1975, D.C., E.D. Mich. (Detroit), Doc. 74–72742, *Charles C. Cohn in his own right and as executor of estate of Samuel L. Cohn, trading as Colonial Alloys Company* v. *Keystone Metal Moulding Company.* **Same, filed** Nov. 21, 1974, D.C., W.D. Mich. (Grand Rapids), Doc. G74–420 CA 1, *Charles C. Cohn, Samuel L. Cohn (Deceased), trading as Colonial Alloys Co.* v. *American Anodoo, Inc.* **Same, filed** Dec. 4, 1974, D.C. Del. (Wilmington), Doc. 74–263, *Charles C. Cohn, in his own right and as executor of the estate of Samuel L. Cohn, trading as Colonial Alloys Company* v. *Amax Aluminum Extrusion Products, Inc.* The above-captioned action is dismissed with prejudice, Apr. 4, 1975. **Same, filed** Dec. 17, 1974, D.C., N.D. Ga. (Atlanta), Doc. C74–2436A, *Charles C. Cohn in his own right and as executor of the estate of Samuel L. Cohn, trading as Colonial Alloys Company* v. *Automotive Moulding Company.* **Same, filed** Jan. 14, 1975, D.C. Del. (Wilmington), Doc. 75–0007, *Colonial Alloys Company* v. *International Telephone and Telegraph Corporation.*

2,945,666, Freeman and Vaudreuil, BALL VALVE, **filed** July 10, 1963, United States Court of Claims (District of Columbia), Doc. 189–63, *Jamesbury Corporation* v. *The United States.* Claims 7 and 8 held valid and infringed, July 11, 1975. **Same, filed** June 29, 1971, United States Court of Claims (District of Columbia), Doc. 520–71, *Jamesbury Corporation* v. *The United States.* Claims 7 and 8 held valid and infringed, July 11, 1975.

3,056,303, A. F. Naylor, HYDRAULICALLY AND SPHERICALLY SUPPORTED INERTIAL REFERENCE, **filed** June 27, 1975, United States Court of Claims (District of Columbia), Doc. 216–75, *TRW Inc.* v. *The United States.*

3,072,582, C. B. Frost, POLYETHER-URETHANE FOAMS AND METHOD OF MAKING SAME, **filed** Mar. 26, 1970, D.C. Del. (Wilmington), Doc. 3867, *The General Tire & Rubber Company* v. *Reichhold Chemical, Inc.* **Same, filed** Mar. 26, 1970, D.C. Del. (Wilmington), Doc. 3868, *The General Tire & Rubber Company* v. *Diamond Shamrock Corporation.* **Same, filed** Mar. 26, 1970, D.C. Del. (Wilmington), Doc. 3866, *The General Tire & Rubber Company* v. *The Upjohn Company.* **Same, filed** Mar. 31,1966, D.C. Del. (Wilmington), Doc. 3183, *Isocyanate Products, Inc. and Murphy Body Works, Inc.* v. *The General Tire & Rubber Company.* **Same, filed** in the District Court, Del. (Wilmington), Doc. 3910, *The General Tire & Rubber Company* v. *Jefferson Chemical Company, Inc.* **Same, filed** May 30, 1973, D.C. Del. (Wilmington), Doc. 4665, *BASF Wyandotte Corporation* v. *The General Tire & Rubber Company.* **Same, filed** July 12, 1973, D.C. Del. (Wilmington), Doc. 4688, *Olin Corporation* v. *The General Tire & Rubber Company.* **Same, filed** in the District Court, Del. (Wilmington), Doc. 3944, *The General Tire & Rubber Company* v. *Wyandotte Chemicals Corporation.* **Same, filed** Mar. 26, 1970, D.C. Del. (Wilmington), Doc. 3945, *The General Tire & Rubber Company* v. *Olin Company.* Final judgment for the above captioned actions, U.S. patent is invalid. The General's complaints and counterclaims against the defendants be dismissed in their entireties with prejudice, that General be enjoined from enforcing said patent against defendants, June 5, 1975.

3,098,578, J. Rudelick, PRESSURE VESSEL, **filed** June 27, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75–362, *Park International and Calgon Corporation* v. *Amalga Corporation.*

3,131,106, F. W. Mackenzie, ADHESIVE TRANSFERS; **3,212,913,** same, **filed** Jan. 30, 1974, D.C., N.D. Ill. (Chicago), Doc. 7?c289, *Letraset USA Inc.* v. *Pressure Graphics Inc.* Final judgment, patents are valid and owned by plaintiff, defendant's counterclaims are dismissed with prejudice and defendant is hereby restrained and enjoined from any infringement of said patent, July 22, 1975.

3,180,074, Joseph F. Smith, HIGH SPEED SPINDLE APPARATUS, **filed** July 30, 1975, D.C.N.C. (Charlotte), Doc. C–C–75–238, *Joseph F. Smith* v. *American Barmag Corporation.*

3,197,204, Holkesvick, Hudnall and Adams, EXERCISING DEVICE; **Reg. No. 749,723** (EXER-GENIE), Exer-Genie, Inc., **filed** July 8, 1969, D.C., C.D. Calif. (Los Angeles), Doc. 69–1305–CC, *Exer-Genie, Inc. et al.* v. *Diversified Products Corporation et al.* Claim 1 dismissed without prejudice, as to patent and Claim 2 for the alleged infringement of trademark be dismissed with prejudice. Claim 3 for unfair competition be dismissed with prejudice and counterclaim for alleged invalidity and non-infringement of patent be dismissed without prejudice, Sept. 16, 1974.

3,212,913. (See 3,131,106.)

3,552,252, Maxey, Montague, Leyde and Bryan, VENEER DEFECT DETECTOR AND CLIPPER CONTROL, **filed** July 3, 1975, D.C., S.D. Ohio (Cincinnati), Doc. 7834, *Tech Serv., Inc.* v. *Black-Clawson Co., Inc.* Parties hereto stipulate that all claims and counterclaims are hereby dismissed with prejudice, July 3, 1975.

3,714,995, Hanes and Larralde, MOTION COMPENSATING APPARATUS; **Re. 28,218,** same, **filed** Jan. 10, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–0070–SW, *Vetco Offshore Industries, Inc.* v. *The Rucker Company.*

3,721,066, A. J. Teller, PROCESS FOR RECOVERY OF ACID GASES; **3,808,774,** same, ABATEMENT OF ACID GAS EMISSIONS, **filed** Mar. 28, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75–280, *Teller Environmental Systems, Inc.* v. *Apex International Alloys, Inc.*

3,785,840, Minnick, Webster and Smith, LIME-FLY ASH-SULFITE MIXTURES, **filed** July 31, 1975, D.C., N.D. Tex. (Dallas), Doc. CA–3–75–0947–D, *IU Technology Corporation* v. *Research-Cottrell, Inc. et al.*

3,808,774. (See 3,721,066.)

Re. 28,218. (See 3,714,995.)

Reg. No. 749,723. (See 3,197,204.)

Erratum

Under Patent Suits in the OFFICIAL GAZETTE of July 8, 1975, volume 936, page 406, the entire paragraph beginning with "3,458,314" should be deleted.

Errata

In the notice of Defensive Publication T934,003, appearing on page 7 in the OFFICIAL GAZETTE of May 6, 1975, the abstract was incorrectly reproduced. The abstract should read as follows:

A process of producing fine particles of thermoplastic polymeric material is disclosed in which a thermoplastic polymeric material and an anionic surfactant are dispersed in a liquid which is not a solvent for said thermoplastic material at a temperature above the melting point of the polymeric material. The dispersion is agitated to form fine molten particles of said polymeric material in said dispersion, and is subsequently rapidly cooled to thereby solidify said particles of polymeric material and prevent agglomeration.

In the notice of Defensive Publication T934,004 appearing on pages 7 and 8 in the OFFICIAL GAZETTE of May 6, 1975, the abstract was incorrectly reproduced. The abstract should read as follows:

A process is disclosed for dyeing a bundle of dry-spun acrylonitrile polymer filaments after the filaments have been extruded through a spinneret from a solution of the polymer in a solvent therefor, and before the solvent remaining after the spinning step has been extracted. The extruded but unextracted filaments are passed over a rotating roll wetted with dye solution, preferably after moistening them by passing them over a rotating roll wetted with water, and are then drawn in air about 1.5X to 2.0X. Preferably, the extrusion, dyeing, and drawing steps are carried out continuously. Temperature conditions are not critical. After the filaments are dyed and drawn, they can be washed to remove spinning solvent and can be drawn further during the wash step.

In the notice of Defensive Publication T934,005 appearing on page 8 in the OFFICIAL GAZETTE of May 6, 1975, the abstract was incorrectly reproduced. The abstract should read as follows:

A coordination catalyst system useful at high temperatures, e.g., 75° C., for making elastomeric high molecular weight copolymers of ethylene and at least one alpha-monoolefin of the formula R—CH_2—CH=CH_2 wherein R can be hydrogen or an alkyl group of 1 to 15 carbon atoms, said catalyst system consisting essentially of (a) titanium tetrabromide, (b) a diorganoaluminum bromide containing 1 to 18 carbon atoms, e.g., diisobutylaluminum bromide, (c) a diorganomagnesium compound represented by the formula R_1R_2Mg wherein R_1 and R_2 are alkyl, cycloalkyl, aralkyl, alkaryl, alkenyl, aryl substituted alkenyl, or cycloalkenyl, and R_1 and R_2 contain a total of 8 to 30 carbon atoms, e.g., *n*-butyl-*sec*-butylmagnesium, (d) as a modifier to raise the copolymer molecular weight, an aliphatic ether of the formula R'OR'' wherein R' and R'' represent alkyl groups each having 2 to 5 carbon atoms, and (e) an inert organic diluent, e.g., hexane, with the proviso that the ratios of magnesium atoms to titanium atoms and aluminum atoms to titanium atoms in the catalyst system are in accordance with the following relationships:

$$Al:Ti=A\ (2\text{-}30):1$$

$$\text{minimum } Mg:Ti=M_{min.}=0.135A+\frac{0.15}{Q}$$

$$\text{maximum } Mg:Ti=M_{max.}=0.826A+\frac{0.05}{Q}$$

where Q is the concentration of Ti (in millimoles/liter) in the reactor liquid phase and ranges from 0.05 to 0.2 and the moles of ether:atom of magnesium being in the range (0.5–1.5):1. The preferred catalyst has components in these proportions: Al:Mg:Ether:Ti=6:3:3:1. It is preferred that the catalyst be formed *in situ* by separate introduction of hydrocarbon solutions of each component; however, catalyst components can be premixed.

Service by Publication

Edward L. Bump

In accordance with 37 C.F.R. 1.47(a) (Rules of Practice in Patent Cases), notice is hereby given of the filing on September 30, 1974, of an application for patent entitled "DISPENSER FOR FLEXIBLE SHEET MATERIAL AND A PERFORATING MECHANISM ADAPTED TO BE USED THEREIN," on behalf of Edward L. Bump, whose last known addresses are 405 South Home Avenue, Oak Park, Ill. 60302, and 900 N. Kilpatrick St., Chicago, Ill. 60212. The application was made in compliance with 37 C.F.R. 1.47(a) and 35 U.S.C. 116 by Paul W. Jespersen without execution by the said Edward L. Bump. Notices of the filing directed to the above noted addresses have been returned undelivered.

Any action to be taken by the said Edward L. Bump in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Certificates of Correction for the Week of Nov. 25, 1975

Re. 28,526	3,869,413	3,891,110	3,899,452
D. 233,264	3,869,442	3,891,276	3,899,656
3,318,830	3,869,445	3,891,545	3,900,025
3,419,622	3,869,492	3,891,552	3,900,077
3,505,611	3,869,586	3,891,690	3,900,169
3,564,620	3,869,591	3,891,766	3,900,233
3,607,218	3,873,020	3,891,978	3,900,297
3,678,063	3,874,032	3,892,153	3,900,299
3,702,334	3,874,134	3,892,211	3,900,300
3,731,012	3,875,159	3,892,224	3,900,400
3,731,275	3,875,737	3,892,339	3,900,527
3,751,399	3,876,114	3,892,585	3,900,528
3,755,745	3,876,791	3,892,626	3,900,606
3,761,407	3,877,177	3,892,865	3,900,611
3,798,565	3,877,510	3,893,086	3,900,647
3,799,779	3,877,561	3,893,102	3,900,691
3,805,205	3,877,638	3,893,109	3,900,783
3,806,674	3,878,189	3,893,227	3,901,030
3,812,204	3,878,383	3,893,826	3,901,081
3,813,427	3,878,470	3,893,949	3,901,269
3,816,903	3,878,745	3,893,959	3,901,301
3,818,037	3,880,312	3,894,104	3,901,346
3,819,000	3,880,658	3,894,158	3,901,380
3,819,663	3,881,326	3,894,361	3,901,429
3,821,244	3,881,783	3,894,368	3,901,656
3,831,404	3,881,823	3,894,978	3,901,727
3,835,107	3,882,454	3,895,143	3,901,728
3,835,360	3,882,973	3,895,222	3,901,834
3,836,368	3,883,063	3,895,279	3,901,973
3,836,795	3,883,768	3,895,432	3,902,017
3,837,585	3,884,382	3,895,481	3,902,461
3,838,316	3,884,620	3,896,062	3,902,539
3,850,895	3,884,644	3,896,131	3,902,671
3,852,122	3,885,058	3,896,140	3,902,697
3,853,430	3,885,229	3,896,204	3,902,870
3,853,846	3,885,619	3,896,351	3,902,929
3,855,203	3,886,090	3,896,384	3,902,942
3,855,206	3,886,091	3,896,886	3,903,079
3,855,393	3,886,909	3,897,247	3,903,109
3,856,923	3,887,637	3,897,504	3,903,144
3,857,213	3,887,733	3,897,615	3,903,314
3,858,939	3,887,807	3,897,823	3,904,171
3,859,094	3,887,862	3,897,995	3,904,213
3,859,468	3,888,172	3,898,126	3,904,375
3,859,525	3,888,330	3,898,182	3,904,464
3,860,661	3,888,918	3,898,247	3,904,549
3,862,138	3,889,096	3,898,381	3,904,719
3,863,983	3,889,530	3,898,548	3,904,965
3,865,693	3,889,641	3,898,689	3,904,973
3,865,739	3,890,028	3,898,759	3,905,040
3,866,604	3,890,386	3,898,808	3,905,717
3,867,613	3,890,705	3,899,276	3,905,718
3,868,603	3,890,744	3,899,301	
3,869,274	3,891,071	3,899,379	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 25, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-30-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-13-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-6-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions: Bleaching; Dyeing and Photography.	1-6-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-9-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-18-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-3-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	4-2-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-5-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-3-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists: Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-7-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-5-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-11-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures: Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-11-75

Expiration of patents: The patents within the range of numbers indicated below expire during November 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,858,537 to 2,862,204 inclusive
Plant Patents..... Numbers 1,768 to 1,774 inclusive

REISSUES

NOVEMBER 25, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,620
CARRYING DEVICE FOR MEDICAL AND VETERINARY USE

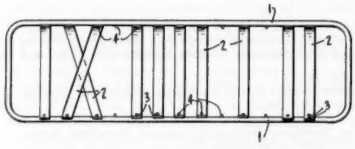
Donald Alfred Jordan, 53 Bayswater Road, Croydon, and Laurence John Hartnett, "Rubra," Watts Parade, Mt. Eliza, Victoria, both of Australia

Original No. 3,740,778, dated June 26, 1973, Ser. No. 234,548, Mar. 14, 1972. Application for reissue Aug. 20, 1974, Ser. No. 499,037

Claims priority, application Australia, Mar. 19, 1971, 4369/71; Nov. 24, 1971, 7155/71; Mar. 16, 1971, 4326/71

Int. Cl. A47b *83/04*; A61g *1/02*

U.S. Cl. 5—82 **3 Claims**



1. A carrying device for medical or veterinary use comprising:

a frame having side members joined by end members.

support means dependent from said frame for supporting said frame at least 3 inches above the surface on which it is supported;

a plurality of headed spigots spaced along each of said side members, each of said spigots being inclined inwardly of said frame;

a plurality of flexible battens adapted to exted across said frame and attachable to said spigots of each of said side members, the ends of said battens being tapered and each of said battens having means for selectively adjusting the effective length thereof when attached to said side members, said means for adjusting comprising a plurality of holes spaced along each of said battens, said holes being dimensioned to receive said spigots.

Re. 28,621
FLUID ANGULAR RATE SENSOR

Kenneth R. Scudder, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Original No. 3,365,955, dated Jan. 30, 1968, Ser. No. 524,358, Feb. 1, 1966. Application for reissue July 17, 1969, Ser. No. 852,265

Int. Cl. G01p *3/26*

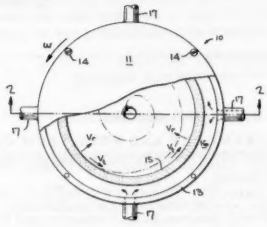
U.S. Cl. 73—505 **7 Claims**

1. In a pure fluid device for sensing the angular rate of rotation of a body about an axis including a vortex chamber having a circular cross-sectional area, means for introducing pressurized fluid into said chamber with substantially only a radial component of velocity and a cylindrical drain passage located at the center of said chamber with the axis of said drain passage coinciding with the axis of said chamber and being parallel to the axis of said body, whereby upon rotation of said device in a plane perpendicular to the axis of said body vortex flow is generated in said chamber and helical flow is generated through said drain passage, improved fluid readout means for said device for sensing changes in said helical flow as a measure of the rate of rotation of said device comprising:

a. a hollow cylindrical pickoff tube located in said drain passage with the axis of said pickoff being transverse to said drain axis;

b. a portion of the wall of said pickoff having aperture means for providing fluid communication between said drain passage and output channel means in said pickoff;

c. said pickoff being orientated in said drain passage with said aperture means displaced from the axis of said drain



by an angle θ such that the pressure produced at said aperture means is substantially static;

d. said pickoff producing fluid output signals in response to the changes in the helical angle of said drain flow as measured by corresponding changes in the static pressure at said aperture means;

e. whereby said fluid output signals are proportional to the angular rate of said rotation.

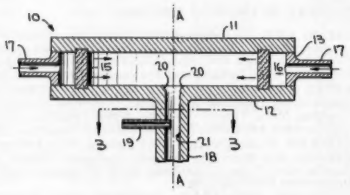
Re. 28,622
FLUID ANGULAR RATE SENSOR

Kenneth R. Scudder, Chevy Chase; John F. Burke, Beltsville, both of Md., and John L. Dunn, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Original No. 3,365,955, dated Jan. 30, 1968, Ser. No. 524,358, Feb. 1, 1966. Application for reissue July 17, 1969, Ser. No. 863,391

Int. Cl. G01f *3/26*

U.S. Cl. 73—505 **10 Claims**



1. In a pure fluid device for sensing the angular rate of rotation of a body about an axis including a vortex chamber having a circular cross-sectional area, means for introducing pressurized fluid into said chamber with substantially only a radial component of velocity and a cylindrical drain passage located at the center of said chamber with the axis of said drain passage coinciding with the axis of said chamber and being parallel to the axis of said body, whereby upon rotation of said device in a plane perpendicular to the axis of said body vortex flow is generated in said chamber and helical flow is generated through said drain passage, improved fluid readout means for said device for sensing changes in said helical flow

as a measure of the rate of rotation of said device comprising:

(a) a hollow cylindrical pickoff tube located in said drain passage with the axis of said pickoff being transverse to said drain axis;

(b) a portion of the wall of said pickoff having aperture means for providing fluid communication between said drain passage and output channel means in said pickoff;

(c) said pickoff being orientated in said drain passage with said aperture means displaced from the axis of said drain by an angle θ such that the pressure produced at said aperture means is substantially static;

(d) said pickoff producing fluid output signals in response to the changes in the helical angle of said drain flow as measured by corresponding changes in the static pressure at said aperture means;

(e) whereby said fluid output signals are proportional to the angular rate of said rotation.

Re. 28,623

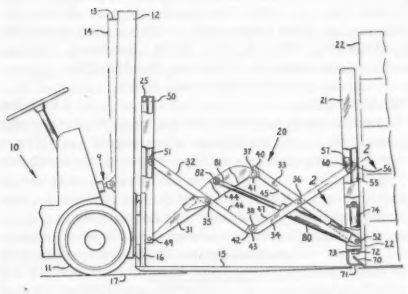
PUSH-PULL ATTACHMENT FOR LIFT TRUCKS

Ronald A. Brudi, Longview, Wash., assignor to Brudi Equipment, Inc., Longview, Wash.

Original No. 3,640,414, dated Feb. 8, 1972, Ser. No. 15,385, Mar. 2, 1970. Application for reissue Apr. 9, 1973, Ser. No. 348,995

Int. Cl.[2] B60P *1/02*

U.S. Cl. 214—514 **10 Claims**



7. In a lift truck having a load carriage mounted for vertical movement and means for selectively tilting said load carriage forwardly or backwardly with respect to said truck, a push frame movable forwardly and rearwardly relative to said carriage for pushing a load off said carriage and selectively extensible and retractable linkage means coupling said push frame and said carriage for operating said push frame, said linkage means comprising a pair of arms extending forwardly and rearwardly between said carriage and said frame and pivoted to one another at a point intermediate the ends thereof, each said arm having an upper coupling and a lower coupling respectively on either side of said pivot point for coupling said arm between said carriage and frame, the length of one of said arms between its upper coupling and said pivot point being less than the length of said other arm between its lower coupling and said pivot point so as to cause backward tilting of said push frame relative to said carriage in response to the extension of said linkage means.

Re. 28,624

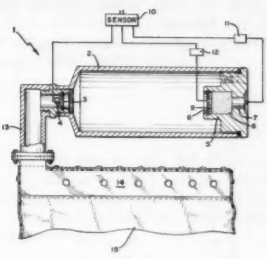
ARGON COMPRESSED GAS SUPPLY

Donald J. Lewis, Troy, and Robert J. Bishop, Rochester, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Original No. 3,756,621, dated Sept. 4, 1973, Ser. No. 195,092, Nov. 3, 1971. Application for reissue Oct. 15, 1973, Ser. No. 406,520

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **1 Claim**



1. Inflatable gas bag system for protection of an occupant of a vehicle comprising inflatable cushion means and a source for providing inflating gas to said means, said source comprising (1) gas generating means for combustible material for supply of generated gas to said cushion means and (2) pressurized stored gas [consisting] *comprising essentially* [of] compressed argon gas, and further including means for at least partially intermixing said generated gas with said compressed argon gas.

Re. 28,625

ROCK DRILL WITH INCREASED BEARING LIFE

Robert A. Cunningham, Bellaire, Tex., assignor to Hughes Tool Company, Houston, Tex.

Original No. 3,620,580, dated Nov. 16, 1971, Ser. No. 60,372, Aug. 3, 1970. Application for reissue Nov. 29, 1974, Ser. No. 528,376

Int. Cl.[3] F16C *19/14*, *21/50*

U.S. Cl. 308—8.2 **15 Claims**

1. In a rock drill wherein a rolling cutter is rotatably mounted on a cantilever bearing pin with the interposition of a set of balls disposed in a pair of registering circumferential races to lock the cutter on the bearing pin, and there is at least one pair of transversely extending and adjoining surfaces on the cutter and bearing pin, one each of the races and one each of the transverse surfaces on the exterior surface of the bearing pin while the other member of each pair is disposed on the interior surface of the rolling cutter, the improvement wherein said races and pair of surfaces are formed and disposed: (1) with said pair of transverse surfaces in frictional contact with one another, and (2) with *a portion of* at least one of the races

spaced from the balls to prevent said balls from carrying outward thrust [.] *and the remaining portion substantially tangent said balls in order to resist substantial inward movement from inward thrust.*

Re. 28,626

ELECTROPHOTOGRAHIC PHOTOSENSITIVE ZINC OXIDE POWDER MIXTURE

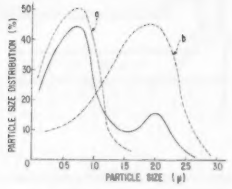
Hajime Miyatsuka, Asaki, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Original No. 3,723,115, dated Mar. 27, 1973, Ser. No. 106,721, Jan. 15, 1971. Application for reissue Jan. 13, 1975, Ser. No. 540,687

Claims priority, application Japan, Jan. 16, 1970, 45-4330

Int. Cl.[2] G03G *5/087*

U.S. Cl. 96—1.8 **4 Claims**



1. An electrophotographic member comprising a support layer and an electrophotographic photosensitive layer disposed on said support layer, said electrophotographic photosensitive layer comprising a powder mixture dispersed in an electrically insulative film forming binder material, said powder mixture being a mixture of larger zinc oxide particles and smaller zinc oxide particles, the ratio by weight of said larger particles to said smaller particles being within the range from 4 : 6 to 1 : 9, said larger particles having an average particle diameter of *not less than* 1.2 microns and said smaller particles having an average particle diameter of *not more than* 0.8 microns, at least 60 percent by weight of said larger particles having a diameter not less than 1 micron and at least 70 percent by weight of said smaller particles having a diameter not more than 1 micron

whereby the particle size distribution curve is characterized by the presence of two peaks respectively corresponding to said smaller and larger particles.

Re. 28,627

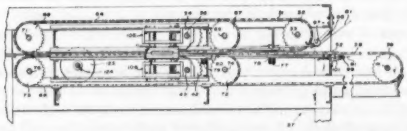
WOOD VENEER AND JOINING AND HANDLING APPARATUS

Victor H. Clausen, Bellevue, and Arnold Zweig, Olympia, both of Wash., assignors to Stetson Ross, Inc., Seattle, Wash.

Original No. 3,445,313, dated May 20, 1969, Ser. No. 481,839, Aug. 23, 1965. Continuation-in-part of Ser. No. 331,893, Dec. 19, 1963, Pat. No. 3,377,223. Application for reissue July 29, 1970, Ser. No. 59,199The portion of the term of this patent subsequent to Apr. 9, 1985, has been disclaimed.

Int. Cl. B27d *1/00;* **B29b** *5/06*

U.S. Cl. 156—433 **10 Claims**



1. A continuous system for processing random width veneer pieces to form a composite veneer sheet comprising in combination; an infeed conveyor, tenderizing apparatus including means to inflict a multitude of spaced shallow knife cuts on the top and bottom surfaces of the individual veneer pieces in the direction of the grain thereof and to feed the pieces onto said infeed conveyor with the grain of the pieces running transverse to the direction of travel of the conveyor, a crowder device adapted to receive said pieces from the infeed conveyor, said crowder device including means to move said veneer pieces into tight edge-to-edge abutment over a given portion of travel, each running longitudinally of the abutting edges, joining apparatus associated with said crowder device for directing a plurality of continuous substantially untwisted strands of fibrous material onto the respective top and bottom surfaces of the moving abutted veneer pieces perpendicular to the grain thereof, said strands being coated with a thermoplastic adhesive, said joining apparatus including means to heat the adhesive on each strand to a flowable state prior to its application to the veneer surface, and a plurality of spring biased shoe members, each of said shoe members being associated with a respective strand to apply further heat and pressure to flatten the strand on the veneer surface, each shoe member including a heated toe portion and a hollow heel portion with a cooling medium therein to insure setting of the adhesive.

Re. 28,628

RADIATION TREATED POLY(ETHYLENE/CHLOROTRIFLUOROETHYLENE) AND POLY(ETHYLENE/TETRAFLUOROETHYLENE) HAVING IMPROVED HIGH TEMPERATURE PROPERTIES

Dana Peter Carlson, Parkersburg, and Norman Eugene West, Vienna, both of Va., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Original No. 3,738,923, dated June 12, 1973, Ser. No. 119,814, Mar. 1, 1971. Continuation-in-part of Ser. No. 4,395, Jan. 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 777,172, Nov., 1968, abandoned. Application for reissue Mar. 29, 1974, Ser. No. 456,158

Int. Cl.[3] C08F *2/46, 8/00*

U.S. Cl. 204—159.2 **14 Claims**

7. A process for [improving the high temperature tensile properties] *increasing the ultimate elongation* of a copolymer selected from the group consisting of poly(ethylene/tetrafluoroethylene) or poly(ethylene/chlorotrifluoroethylene), comprising subjecting the copolymer [to an effective amount of ionizing radiation.] , *after melt fabrication to an amount of ionizing radiation effective to increase the ultimate elongation of the copolymer when measured at 200° C.* the ethylene content of said copolymer being from 40 to 60 mole percent and the tetrafluoroethylene or chlorotrifluoroethylene content of said copolymer being from 40 to 60 mole percent, based on the ethylene plus tetrafluoroethylene or chlorotrifluoroethylene content of the copolymer.

Re. 28,629

ION EXCHANGE OF CRYSTALLINE ZEOLITES

Philip K. Maher, Baltimore, and Carl V. McDaniel, Laurel, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Original No. 3,402,996, dated Sept. 24, 1968, Ser. No. 602,766, Dec. 19, 1966. Continuation-in-part of Ser. No. 481,669, Aug. 23, 1965, Pat. No. 3,293,192, and a continuation-in-part of Ser. No. 553,272, May 27, 1966, abandoned, and a continuation-in-part of Ser. No. 427,967, Jan. 25, 1965, Pat. No. 3,375,065. Application for reissue Sept. 10, 1970, Ser. No. 71,283

Int. Cl. C01b *33/23;* **B01j** *11/40*

U.S. Cl. 423—112 **9 Claims**

1. A process of cation exchanging crystalline zeolite aluminosilicates, including exchanging locked-in cations comprising:

(a) Exchanging the zeolite with a solution of a salt of at least one desired metal cation to an original cation content of less than 3–4% by weight,

(b) Washing to remove excess salts,
(c) Drying and heating the exchanged zeolite at a temperature of 400° to 1500° F. to redistribute the locked-in cations for each exchange,
(d) Cooling the calcined zeolite and reducing the original cation content by a second ion exchange,
(e) Washing, drying and recovering the product.

Re. 28,630

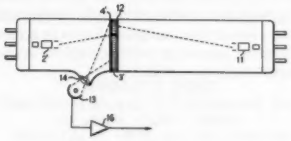
DATA HANDLING SYSTEM WITH SCREEN MADE OF FIBER OPTIC LIGHT PIPES CONTAINING PHOTOCHROMIC MATERIAL

Omer F. Hamann, La Jolla, Calif., assignor to Stromberg DatagraphiX, Inc., San Diego, Calif.

Original No. 3,400,214, dated Sept. 3, 1968, Ser. No. 392,251, Aug. 26, 1964. Application for reissue June 19, 1974, Ser. No. 480,616

Int. Cl.[2] H04N *5/68*

U.S. Cl. 178—7.87 **13 Claims**



1. In combination, a screen comprising a target electrode formed of a fiber optic element including a plurality of light pipes made of a composition containing a material which attenuates the transmission of electromagnetic radiation of a first frequency upon being exposed to electromagnetic radiation of a second frequency higher than said first frequency, reading means exposing said light pipes to said electromagnetic radiation of said first frequency for transmission therethrough, writing means for selectively causing certain of said light pipes to be exposed to said electromagnetic radiation of said second frequency to selectively cause electromagnetic radiations of said first frequency emanating from said reading means to be absorbed in said certain one of said light pipes while permitting said radiations to pass through the other light pipes, and output means for indicating which light pipes have absorbed said electromagnetic radiation of said first frequency to produce informational output signals.

Re. 28,631

HIGH VOLTAGE DEFLECTION CORRECTION IN CRT DISPLAYS

Glenn C. Waehner, Riverside, Conn., and Thomas J. Ray, Yonkers, N.Y., assignors to United Technologies Corporation, East Hartford, Conn.

Original No. 3,713,001, dated Jan. 23, 1973, Ser. No. 219,465, Jan. 20, 1972. Application for reissue Sept. 16, 1974, Ser. No. 506,061

Int. Cl.[2] H01J *29/70*

U.S. Cl. 315—371 **1 Claim**

2. In a cathode ray tube display system receiving raw x and y deflection voltages to govern desired displays on the cathode ray tube, the deflection voltage modificationn apparatus comprising:

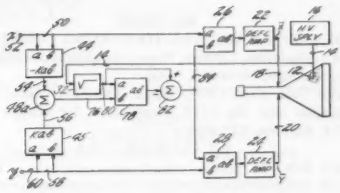
a cathode ray tube having a high voltage anode;

a high voltage supply providing an anode voltage to the anode of said cathode ray tube;

means responsive to said high voltage supply for providing a signal as a function of the square root of said anode voltage;

sun *sum* means receiving raw x and y deflection voltage signals and providing a negative scalar of the sum of the squares thereof;

means responsive to said sum means *and* said square root means and said high voltage supply for providing a signal which is a function of said anode voltage *square root signal* minus the product of said square root signal and said negative scalar function of said sums of squares signals; and



means receiving said raw x and y deflection voltages and responsive to said last named means for providing X and Y deflection signals to said cathode ray tube as respective products of the output of said last named means and said raw deflection voltages.

Re. 28,632

TELEVISION TUNER

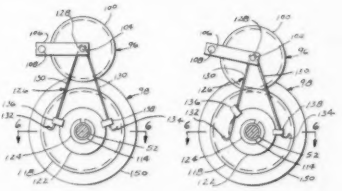
Joe G. Badger, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Original No. 3,218,588, dated Nov. 16, 1965, Ser. No. 121,210, June 30, 1961. Application for reissue Mar. 18, 1966, Ser. No. 538,145

Claims priority, application Austria, Mar., 1941, 160318

Int. Cl.[2] H03J *5/06, 1/14*

U.S. Cl. 334—51 **11 Claims**



1. In a television tuner, the combination of, a channel selector shaft rotatable to a plurality of channel selecting positions, a support structure rotatable with said selector shaft and carrying a plurality of individually adjustable gear elements for fine adjustment to different television channels, a fine tuning shaft concentric with said selector shaft, said adjustable gear elements moving in a predetermined path around said selector shaft as said support structure is rotated, a fine tuning gear secured to said fine tuning shaft, a movable member, an auxiliary shaft journalled for rotation in said movable member and and bodily movable therewith, first gear means on said auxiliary shaft and positioned outside said predetermined path of said adjustable gear elements, means for interconnecting said auxiliary shaft and said fine tuning gear, an actuating plate rotatably mounted on said fine tuning shaft, slip clutch means interconnecting said actuating plate and said fine tuning shaft, and means reponsive to rotation of said actuating plate upon initial rotation of said fine tuning shaft in either direction for moving said movable member so that said first gear means is moved inwardly into engagement with a selected one of said adjustable gear elements and said interconnecting means is moved into engagement with said fine tuning gear, said slip clutch means acting upon the application of additional torque to said fine tuning shaft in the same direction to

disengage said actuating plate from said fine tuning shaft thereby to permit adjustment of said selected gear element while maintaining said first gear means in engagement therewith upon further rotation of said fine tuning shaft in said same direction.

Re. 28,633

SOLID STATE DIGITAL-TO-ANALOG CONVERTER

James J. Pastoriza, Lincoln, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Original No. 37,470,887, dated July 17, 1973, Ser. No. 102,854, Dec. 30, 1970. Application for reissue Nov. 18, 1974, Ser. No. 524,474

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 DA **11 Claims**

9. An integrated-circuit digital-to-analog converter comprising:

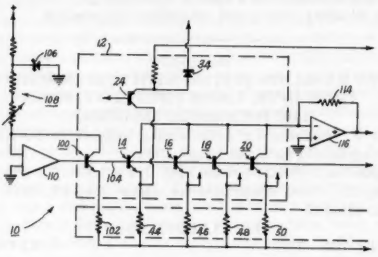
a plurality of transistors on a single monolithic substrate;

an output line;

switch control means operable by a digital input for selectively activating any of said transistors to pass the current thereof through said output line;

circuit means for said transistors to set different levels of current through each transistor according to a predetermined weighting pattern such that the sum of the currents produced in said output line by the selected transistors represents an analog output corresponding to said digital input;

each of said transistors being formed to present in said substrate a respective conductive area proportional to the particular current level assigned thereto in accordance with said weighting pattern to provide uniform current density in the activated transistors.



PLANT PATENTS

GRANTED NOVEMBER 25, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,808
APPLE TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed Jan. 9, 1975, Ser. No. 539,767
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of semi-dwarf apple tree, as illustrated and described, bearing medium size firm fruit of good eating and cooking quality, having a semi-dwarf growth habit, heavy spurring, and being highly productive.

3,809
APRICOT TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed Jan. 9, 1975, Ser. No. 539,768
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of apricot tree, substantially as herein shown and described, characterized particularly as to novelty by its large fruit, its even distribution of fruit throughout the tree, its short maturity period being five days earlier than Flaming Gold apricot, and the high degree of firmness of fruit when mature providing good shipping characteristics.

3,810
CHERRY TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed Jan. 9, 1975, Ser. No. 539,769
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—37 **1 Claim**

1. A new and distinct variety of cherry tree, as illustrated and described, bearing large, red, firm fruit of good eating quality; by a tree with dwarf characteristics of close leaf nodes, short heavy branches, and a stocky trunk.

3,811
PLUM TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed Jan. 9, 1975, Ser. No. 539,770
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, which bears medium-size, clingstone fruit with firm, yellow flesh and deep violet skin, in contrast with its seed parent, Red Beaut, which bears fruit less productively and regularly, which fruit has a red skin, yellow flesh, and is smaller.

PATENTS

GRANTED NOVEMBER 25, 1975

ERRATA

For CLASS	See PATENT NO.
235–092	3,921,875
303–021 F	3,922,021
303–021	3,922,022
303–021 F	3,922,023
305–027	3,922,024
058–140 A	3,922,041
250–216	3,922,522
250–320	3,922,523
250–330	3,922,524
250–231	3,922,525
235–152	3,922,526

PATENTS

GRANTED NOVEMBER 25, 1975

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,921,221
HOSPITAL GOWN HAVING FITTING MEANS

Richard L. Zoephel, Lake Villa, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed May 24, 1974, Ser. No. 473,017
Int. Cl.² A41D *13/00*
U.S. Cl. 2—51 **6 Claims**

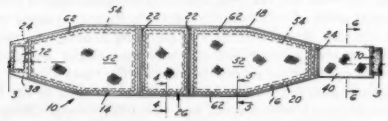
1. In a hospital gown having an area which encircles a part of a wearer's body in a given direction and is larger in size than necessary to encircle said part, which area requires a decrease in said size in said direction to provide close fitting to said part, the improvement comprising;

said area having means including a plurality of portions defining surfaces elongated throughout said given direction of encirclement, said portions bearing a cohesive-adhesive material thereon, whereby by bringing any portion into contact with another portion they will cohere to each other to decrease the size of said area in said given direction thereby adjustably decreasing the size in said direction from said larger size to the smaller size required to provide a close fit to said part of said wearer's body.

3,921,222
RIB CAGE PROTECTOR PAD

George A. Hollman, 7127 Proctor Ave., Detroit, Mich. 48226

Filed Mar. 18, 1975, Ser. No. 559,414
Int. Cl.² A41D *13/00*
U.S. Cl. 2—2 **10 Claims**



1. A rib cage protective device adapted to be worn in an endless array around the rib cage of a person for protecting the ribs and preventing the ribs and back from receiving blows during athletic competition or the like comprising a pair of elongated and transversely bendable pads of generally similar size and configuration, said pads being engageable with the ribs of the person wearing the device, said pads being spaced apart and each having a pair of longitudinally extending edges and a pair of laterally extending edges, an intermediate band connecting the opposing lateral edges of said pads and engageable with the back of the user, each of said pads and band including a pair of layers of sheet material having interposed therebetween a stiffening element which is capable of being bent when applied around the ribs and back of the user, the mating longitudinal and lateral edges of the layers of each of said pads being secured together to enclose said stiffening element, the other lateral edge on one of said pads being provided with a tab and the other lateral edge on the other of said pads being provided with an elastic strap, said tab and said strap being provided with means for removably securing the strap to the tab when the protective device is worn around the rib cage of the user.

3,921,223
AIR SHIELD FOR WELDERS AND OTHER CRAFTSMEN EXPOSED TO NOXIOUS FUMES

David V. Hoyecki, 394 Boynton Ave., San Jose, Calif. 97117

Filed June 12, 1974, Ser. No. 478,722
Int. Cl.² A61F *9/06*
U.S. Cl. 2—8 **6 Claims**

1. An air shield comprising:

a. a conduit dimensioned and contoured to be worn about the neck of an operator exposed to noxious fumes,

b. connecting means for connecting the conduit to a source of air under a predetermined pressure,

c. along the length of the conduit a plurality of openings communicating with the conduit interior and arranged to provide, when supplied with air under pressure, a plurality of air jets directed outwardly and forming an air curtain in front of and moving outwardly from the face of the operator, thereby dispersing the fumes and minimizing the hazard thereof,

d. the conduit being in the form of a loop adapted to encircle the neck and said plurality of openings being disposed at circumferentially spaced intervals about the loop to provide, when supplied with air under pressure, a plurality of air jets forming an air curtain moving peripherally outward from around the neck of the operator.

3,921,224
GARMENTS FOR MOTORCYCLING

Robert F. Ingram, III, Atlanta, Ga., assignor to Covington Industries, Inc., Atlanta, Ga.

Filed May 1, 1974, Ser. No. 465,995
Int. Cl.² A41D *1/02*
U.S. Cl. 2—93 **3 Claims**

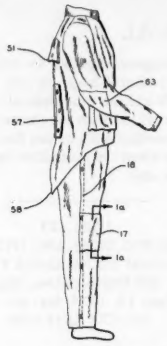
1. A motorcycle jacket, particularly useful for touring on a motorcycle, wherein the improvement comprises:

a. sleeves on said jacket which are of a length longer than a predetermined length corresponding to the wearer's standard suit jacket size to prevent the sleeves from riding up over the wearer's wrist when the wearer extends his arms during riding of a motorcycle;

b. a back which is cut lower than the front of said jacket to prevent the jacket from riding up and exposing the rider's back;

c. a storage pack formed in the back of the jacket having a zipper closure and a flap covering said zipper closure with snaps included for attaching said flap in place;

d. a ventilation flap on the back of said jacket including a flap, means for fastening said flap to the back of said jacket and perforated material underneath said flap; and

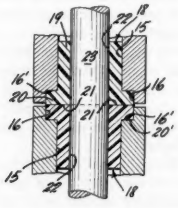


e. a two-way zipper closing at the front of said jacket with a protective flap covering said zipper and means for attaching said flap to the front of said jacket.

3,921,225
LONG LIFE HINGE

Charles R. Suska, Roxbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Continuation-in-part of Ser. No. 279,175, Aug. 9, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,772
Claims priority, application Canada, Aug. 7, 1973, 178211
Int. Cl.² E05D *11/04*
U.S. Cl. 16—136 **44 Claims**

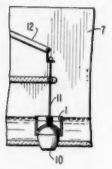


1. A long life hinge, comprising;
two hinge leaves, first and second axially aligned and closely spaced hinge knuckles, at least one knuckle formed on each leaf along the adjacent edges thereof;
recesses formed in adjacent ends of said first and second knuckles.
a first plastic bushing received in and radially supported by the first knuckle recess and having a smooth end face exposed at the end of said first knuckle;
a second plastic bushing received in and radially supported by the second knuckle recess and having a smooth end face exposed at the end of said second knuckle;
a hinge pin extending through and radially borne by said bushings to connect said knuckles in end to end relationship with the end faces of said bushings in sliding engagement, at least one of the bushings protruding slightly from said knuckle recess to provide closely spaced hinge knuckles that substantially conceal the bushings from view, said hinge pin rotating relative to the first bushing and being stationary with respect to the second bushing; said first bushing being essentially formed of an acetal resin with at least 5 percent by weight of dispersed discrete particles of a low friction material having the property of transferring in a self-renewing film to a surface against which it rubs; and
said second bushing being essentially formed of a material selected from the group consisting of an aromatic polycarbonate derived primarily from bisphenol A, a thermosetting phenolic resin and an acetal resin.

3,921,226
FLUSH VALVE REGULATOR

Warren E. Macdonald, 40 Sunset Drive, Seekonk, Mass. 02771

Filed Feb. 8, 1974, Ser. No. 440,738
Int. Cl.² E03D *1/22, 1/34*
U.S. Cl. 4—56 **1 Claim**



1. In a toilet flush tank having a buoyant flush valve with a convex upper surface and a lower sealing portion, a valve seat that cooperates with the valve lower portion, a valve stem connected to and extending upwardly from the upper surface of the flush valve and with an upper end, operating means connected to the upper end operable to lift the flush valve from the valve seat, and a guide bracket for the valve stem, said bracket having an aperture through which said stem extends and having a shoulder positioned between the upper end of the stem and the flush valve but below the tank water level, an improved flush valve regulator for spacing the flush valve below the guide bracket in proximity of the valve seat to effect early closure of the flush valve, the flush valve regulator comprising a generally cylindrical wall with an upper edge and a lower edge, a concave bottom head integrally attached to the lower edge of the wall, a centrally disposed sleeve slidably mounted on the valve stem between the flush valve and the guide bracket and positioned to engage the bracket shoulder upon lifting said stem, the sleeve being generally coaxial with the wall, integrally connected to the head, extending upwardly from the head to the upper edge of the wall, loosely fitting on the valve stem between the flush valve and the guide bracket, a plurality of radially extending webs between the sleeve and the wall for holding the sleeve centrally in position, each web being integrally connected to the wall, the sleeve and the head, the wall, sleeve, head and webs being fabricated from an integral piece of substantially neutrally buoyant plastic material, the wall, sleeve and head cooperating to define an annular water receiving reservoir, the wall and sleeve defining an annular opening for receiving water in the reservoir, the convex head adapted to seat on the convex surface of the flush valve during closure thereof and adapted to avoid changes in force required to actuate the operating means.

3,921,227
CATALYST CONTAINER IN INCINERATOR TOILET

Ernest Bayne Blankenship, Dallas, Tex., assignor to Research Products/Incinolet Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 460,924, April 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 445,661, Feb. 25, 1974, abandoned. This application July 1, 1974, Ser. No. 484,953
Int. Cl.² A47K *11/02*
U.S. Cl. 4—131 **25 Claims**

1. In an incinerator toilet having an incinerator chamber; heating means for incinerating waste products; and a flow path extending from said incinerator chamber to a gas removal

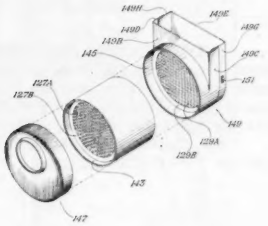
means for removing gases from said incinerator chamber, a catalyst container adapted to be located in said flow path between said incinerator chamber and said gas removable means and containing a heat activated catalyst for removing odors, said catalyst container being adapted to be located to one side of said incinerator chamber and comprising;

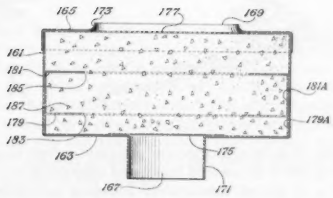
an inlet and an outlet,

a catalyst chamber section located between said inlet and outlet for holding a heat activated catalyst for reducing odors,

a diffusion chamber located between said inlet and said catalyst chamber section,

a gas collection chamber located between said catalyst chamber section and said outlet,





said diffusion chamber and said catalyst chamber section being separated by an upstream wall means having a plurality of small inlet apertures for allowing the passage of gas from said diffusion chamber into said catalyst chamber section and for holding said heat activated catalyst in said catalyst chamber section,

said catalyst chamber section and said collection chamber being separated by a downstream wall means having a plurality of small outlet apertures for allowing the passage of gas from said catalyst chamber section to said collection chamber and for holding said heat activated catalyst in said catalyst chamber section.

3,921,228

DECOMPOSITION TOILET

Tommy Mikael Sundberg, Krondammsvagen 49, S-433 00 Partille, Sweden

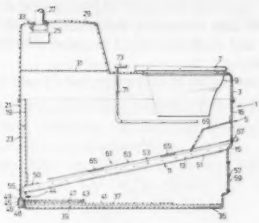
Filed Apr. 1, 1974, Ser. No. 456,821

Claims priority, application Sweden, Apr. 3, 1973, 73034653

Int. Cl.² A47K *11/02*

U.S. Cl. 4—131 **2 Claims**

1. A decomposition toilet comprising a casing having an opening surrounded by a seat, said casing have a bottom wall, a rear wall and an intermediate wall spaced from said rear wall to form an air duct there between, the latter having an air intake at its lower end adjacent to and slightly spaced from the bottom wall and an air outlet at its upper end, a fan at the rear portion of the casing facing the air outlet, a grid-like bed for faeces under said opening, said grid-like bed comprising a plurality of sloping pipes having their lower ends carried by said intermediate wall, a trough positioned beneath each of said pipes and extending longitudinally thereof to catch running liquid and lead it to the rear of said casing, a mould container beneath said bed, heating means to effect decomposition of the faeces lying on said grid-like bed, so that the



mould generated thereby will fall through the grid-like bed to said mould container, said heating means being arranged at the bottom of said casing in contact with the liquid collected at the bottom for heating of said liquid.

3,921,229

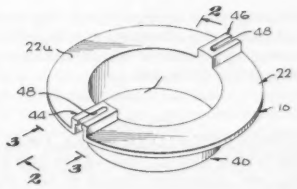
WATER CLOSET RING

Morris Yavitch, 1008 Benedict Canyon, Beverly Hills, Calif. 90210

Filed Mar. 6, 1975, Ser. No. 555,977

Int. Cl.² E03D *11/13*; **F16L** *5/00, 15/00*

U.S. Cl. 4—252 R **3 Claims**



1. A water closet drain apparatus comprising:

a drain ring having a tubular portion with upper and lower ends for passing effluent and having a flange at the upper end of said tubular portion, said flange having a plurality of bolt-receiving regions which are angularly spaced from one another about said flange, said flange being bowed-up at each of said bolt-receiving regions to receive the head of a bolt therein, and said flange having a radially-extending slot at the middle of the region to pass the shank of a bolt.

3,921,230

APPARATUS FOR RAISING THE END OF A BED MATTRESS

Robert Hanning, Via Tagliaferri 15, Campione d'Italia, Italy, and Gernot Neumann, Teichstrasse 3, Oerlinghausen, Germany

Filed May 24, 1974, Ser. No. 472,989

Claims priority, application Germany, May 25, 1973, 2326709

Int. Cl.² A47B *83/04*; **A61G** *7/10*

U.S. Cl. 5—68 **7 Claims**

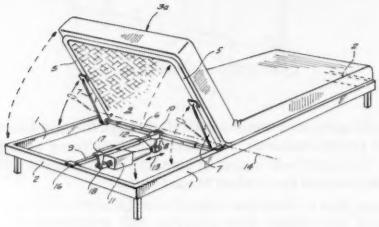
1. For use in combination with a hospital-type bed frame having parallel longitudinal sides and parallel transverse sides and a mattress having a portion hinged for displacement relative to another portion and resting on said frame, a mattress-displacing unit engageable with said displaceable portion of said mattress for selectively raising and lowering same, said unit comprising:

a rigid shaft extending transversely to said longitudinal sides;

first hanger means engaging said shaft at opposite ends thereof and mounting said shaft on said longitudinal sides for rotation of said shaft;

a stationary rigid bar rotatably engaging said shaft at one end of said bar and extending perpendicular to said shaft for retaining said shaft at a fixed location relative to the other end of said bar;

further hanger means at said other end of said bar engageable with a side of said frame;



at least one lifting arm extending radially from said shaft and rotatably entrained therewith, said arm having a free end bearing on the undersides of said displaceable portion of said mattress for raising and lowering same relative to said frame upon rotation of said shaft;

a crank lever carried by said shaft and rotatably entraining same;

a linear positioning motor having relatively displaceable parts, one of said parts being articulated to said crank; and

means for mounting the other of said parts on said stationary bar between said ends thereof.

3,921,231

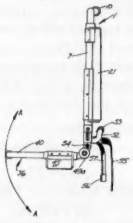
COMBINATION ADJUSTABLE BREAK-AWAY SCOOP STRETCHER AND EXTRICATION DEVICE

Elroy E. Bourgraf, Cincinnati; Kenneth R. Self, Washington, and Robert E. Dunn, Bloomingburg, all of Ohio, assignors to Ferno-Washington, Inc., Wilmington, Ohio

Filed May 2, 1974, Ser. No. 466,275

Int. Cl.² A61G 1/00, 7/10

U.S. Cl. 5—82 **12 Claims**



1. A break-away scoop stretcher and extrication device comprising an upper frame section, a lower frame section, and a seat frame section, said upper frame section being adapted to be selectively connected to either said lower frame section or to said seat frame section, each of said frame sections comprising a complimentary pair of frame parts detachably interconnected at one end by a pivot lock means, frame section locking means for selectively interconnecting either said lower frame section or said seat frame section to said upper frame section, said frame section locking means comprising first locking parts mounted on the remaining ends of the frame parts forming said upper frame section, coacting second locking parts mounted on the remaining ends of the frame parts forming said lower frame section, and additional coacting locking parts mounted on the remaining ends of the frame parts forming said seat frame section, said upper and lower frame sections when interconnected providing a stretcher for receiving a patient in prone position, said coacting second locking parts when interengaged with said first locking parts acting to rigidly interconnect said upper and lower frame sections in a common plane, and said upper and seat frame sections when interconnected by interengaging said additional coacting locking parts with said first locking parts forming an extrication device and stretcher for receiving a patient in an inclined position, said additional locking parts including adjustable locking means mounting said seat frame section for pivotal movement relative to said upper frame section.

3,921,232

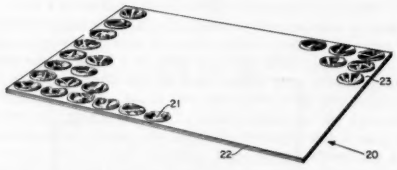
SELF-INFLATING STRUCTURE

David Denzil Whyte, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 456,510, March 29, 1974, Pat. No. 3,849,033. This application Feb. 20, 1975, Ser. No. 551,443

Int. Cl.² A61G 7/04; A47C 27/08

U.S. Cl. 5—91 **4 Claims**



1. An absorbent composite structure comprising a self-inflating pillow structured laminated backsheet comprising a plurality of spaced substantially collapsed inflatable pillows, and an absorbent pad, said laminated backsheet comprising a plain lamina of substantially water impermeable thermoplastic film, an embossed lamina of semipermeable thermoplastic film which is substantially water permeable, and a predetermined amount of water-reactive gas-evolving reagent, said embossed lamina having a plurality of pillow forming embossments formed therein which are spaced by unembossed areas of said embossed lamina, said pillows being formed by sealingly securing said unembossed areas of said embossed lamina to adjacent portions of said plain lamina while said embossments are substantially collapsed and with a predetermined quantity of said reagent disposed within each said embossment, said absorbent pad having a plurality of spaced apertures therethrough which are so spaced and configured to accommodate said pillows, said absorbent pad being secured to said embossed lamina of said laminated backsheet with said pillows in registration with said apertures whereby said pillows extend through said apertures when inflated by gas evolved by said reagent when water permeates said embossments of said embossed portions of said pillows formed from said embossed lamina and said water reacts with said reagent.

3,921,233

PEDIATRIC CRIB

Stuart N. Mann, Derby, N.Y., assignor to John F. Hurley, Scituate, Mass.

Filed Nov. 11, 1974, Ser. No. 522,636

Int. Cl.² A47D 7/00, 7/02

U.S. Cl. 5—97 **17 Claims**

1. A crib which comprises in combination:

a. a mattress support means;

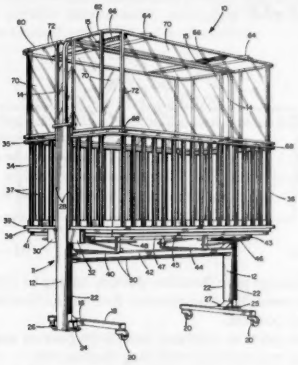
b. upright safety end and side wall elements to define a peripheral restraining safety crib wall about the support means, at least one of such wall members adjustably

movable between one closed upright position and another open lower position to permit access to the crib area;

c. a vertical frame member at each end of the crib;

d. a security top support means; and

e. a first and second security top element hingedly secured to the support means, the security top elements defining in combination in a closed position an enclosure about the top of the crib when the safety end and side walls are in a closed upright position, the security top elements



secured to the support means, whereby the security top elements are adapted to be positioned in a closed restraining position which encloses the top portion of the crib in a closed relationship with the end and side wall elements and about the end and wall elements and selectively to an open position when the top security elements are hingedly movable outwardly and upwardly from the central support means to an open raised position to provide access to the crib area.

3,921,234

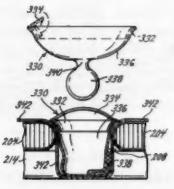
PORTABLE SUPPORT FOR A BED PATIENT

Milo F. Mracek, Creve Coeur, and Ronald J. Bauer, Florrissant, both of Mo., assignors to Milo F. Mracek, Creve Coeur, Mo.

Division of Ser. No. 214,806, Jan. 3, 1972, Pat. No. 3,795,284. This application Nov. 29, 1973, Ser. No. 420,082

Int. Cl.² A61G *9/00*

U.S. Cl. 4—112 **8 Claims**



1. A disposable bedpan which is usable to receive waste material from either or both of the waste openings of a person while said person is in a supine position and which has an open top and which has a flexible bottom with an opening therein substantially smaller than said open top and which has a flexible specimen collector depending downwardly from said opening, said flexible bottom of said bedpan serving to receive said waste material and to guide said waste material toward said opening and hence toward said flexible specimen collector, said flexible specimen collector being adapted to receive said waste material from said flexible bottom via said opening and to hold said waste material, said open top of said bedpan being long enough and wide enough to simultaneously underlie both of said waste-emitting openings of said person while said person is in said supine position, said open top of said bedpan being displaced from and being out of engagement with said waste openings of said person while said person is in said supine position and said bedpan is in position to receive said waste material.

3,921,235

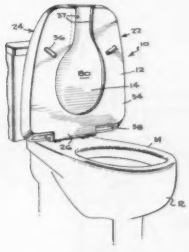
WATER CLOSET SEAT AND LIFT COVER

Robert A. O'Neil, Wheaton, Ill., assignor to Beneke Division, Beatrice Foods Co., Columbus, Miss.

Filed May 10, 1974, Ser. No. 469,038

Int. Cl.² A47K *13/00*

U.S. Cl. 4—234 **27 Claims**



1. A combination closet seat and lift cover for use on the receptacle of a closet which comprises: a closet seat having a central opening providing access to the receptacle of the closet support means forming on each side of said opening the support for the user of the seat, means secured to said seat for connection to said closet to permit relative pivotal movement therebetween, a central lift cover pivotally connected to said closet seat being sized to be complementary to and fit within said opening, and provided with an undulating upper surface forming a central depression, said center lift cover together with said support means forming an essentially continuous contoured sitting surface when in the down position

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3,921,236

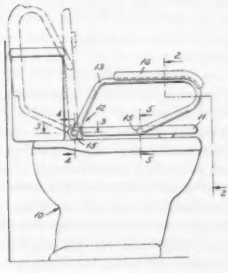
TOILET SUPPORT

Kenneth H. Klein, Plymouth, Mich., assignor to C. D. Sparling Co., Plymouth, Mich.

Filed Dec. 20, 1974, Ser. No. 534,752

Int. Cl.² E03D *11/00*

U.S. Cl. 4—254 **14 Claims**



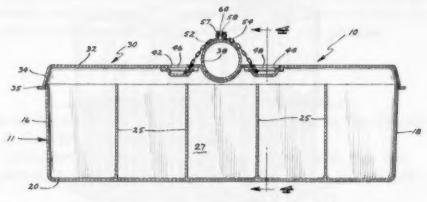
1. In a toilet support for use in a toilet bowl having hinge means hinging a toilet seat to the bowl about a hinge axis, the combination comprising

an arm having spaced ends and an intermediate hand-gripping portion,
bearing means for mounting one end of said arm adjacent said hinge means, the other end of said arm being held in said seat
said toilet seat having a laterally extending opening,
and means extending from the other end of said arm into said opening whereby when said arm is raised, the toilet seat is raised or vice versa.

3,921,237
THINWALL REAMING PLIERS FOR ELECTRICAL CONDUIT
Paul Carl Steiner, Johnsonville, Ill.
Filed Jan. 28, 1974, Ser. No. 400,938
Int. Cl. B25f *1/00*
U.S. Cl. 7—5.4 **4 Claims**

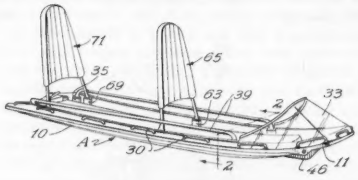
1. A conduit reaming and reshaping tool comprising a pair of levers pivoted together intermediate their ends to form handle members on corresponding end portions thereof and to form jaw members on the opposite corresponding end portions thereof of each of the levers, the handles movable toward and away from each other with a pliers like movement effecting corresponding movement of the jaw members, the jaw members being in substantially the same plane with each other for movement toward and away from each other, each jaw member having an inner edge surface and an outer edge surface which are connected together at a forward nose end of the tool providing an elongated tapered sharp nose end for the tool, each outer edge surface extending lengthwise along the jaw from the nose end thereof and tapering transversely outwardly in a direction opposed to the inner edge of the jaw and terminating in a very sharp edge, each outer edge having a base portion approximately the full thickness of the jaw member and tapering outwardly therefrom to the sharp outermost edge, the inner edge surface of each jaw disposed in opposed alignment to one another in a manner to confront each other with each inner edge including therein a semi-circular aperture extending therethrough intermediate the pivot mounting and the tool nose end, the apertures lying opposite each other in the closed position of the jaw members in a manner defining a circular opening therethrough, a plurality of radially extending fingers projecting from each of the jaws into the associated aperture, the leading ends of each of the fingers providing a substantially circular passage therebetween when the jaws are in the closed position, the passage being of a lesser diameter than the diameter of a length of electrical type conduit intended to be received in the passage, the leading ends of the fingers adapted to selectively engage and circumferally surround the conduit inserted through the passage for purposes of reaming the outer peripheral edge end surfaces thereof.

3,921,238
DREDGE PIPE FLOTATION
Glenn Johnson, Box 344, Cambridge, Minn. 55008
Filed Sept. 6, 1974, Ser. No. 503,661
Int. Cl.² B63B *35/44*
U.S. Cl. 9—1 R **1 Claim**



1. A dredge pipe flotation device, having in combination
an enclosed flotation member forming a chambered hollow body portion,
a cover portion overlying said body portion and having an open top channel extending thereacross,
a pair of spaced recesses at one side of said channel and an opposed pair of like recesses at the other side of said channel,
a pin member intersecting each of said recesses extending thereacross and being secured therein,
chain members each having an end portion secured to one of said pin members, and
means removable securing the corresponding pairs of the opposed other end portions of said chain members.

3,921,239
MULTI-PURPOSE VEHICLE
Cedric C. Sovia, 319 S. Lake St., Forest Lake, Minn. 55025, and Kenneth W. Krengel, 1800 Highland Parkway, St. Paul, Minn. 55116
Filed May 15, 1974, Ser. No. 470,055
Int. Cl.² A63C *15/00*
U.S. Cl. 9—310 B **7 Claims**



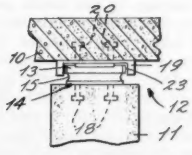
1. A multi-purpose vehicle including:
a slightly upwardly concave chassis provided with an elongated body having an upwardly curved forward end,
said body being formed of a plastic material capable of sustaining its weight in water,
a windshield secured to said body at the forward end thereof to extend upwardly and inwardly therefrom,
sides extending upwardly from opposite sides of said body and integral therewith,
a downwardly and outwardly extending flange on said sides and continuing about the upwardly curved forward end of said body,
inwardly extending bosses in opposed relation on opposite portions of said sides and having upwardly opening parallel sockets therein,

a seat back having seat back supporting members extending downwardly therefrom to terminate in parallel vertically extending ends engaged in said sockets,
a second pair of opposed inwardly extending bosses on said sides forwardly of said first named bosses,
a third pair of opposed inwardly extending bosses on said sides spaced rearwardly of said second pair of bosses,
said second and third pairs of bosses having vertical inwardly opening sockets therein, and
a side rail extending longitudinally of each side of said body having parallel downwardly extending ends extending into the second and third pairs of sockets.

3,921,240
STRUCTURAL BEARINGS

Edward R. Fyfe, Burlington, Canada, assignor to Elastometal Limited, Burlington, Canada

Division of Ser. No. 137,896, April 27, 1971, Pat. No. 3,806,975, which is a continuation-in-part of Ser. No. 27,700, April 13, 1970, abandoned. This application Oct. 29, 1973, Ser. No. 410,558
Int. Cl.² E01D *19/06*
U.S. Cl. 14—16 **16 Claims**



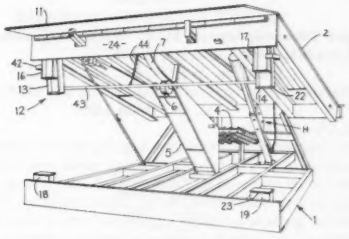
1. A bearing for a bridge or similar structure to permit sliding and rotational movement between said structure and a support therefor, said bearing comprising a first plate member, a second plate member generally parallel to said first plate member and mounted for sliding movement parallel to said first plate member, a third plate member, means for securing said first and third plates to said structure and said support, a load bearing elastomer pad interposed between said second and third plates to absorb the load of said structure and a cooperating bearing member constructed and arranged to substantially prevent shearing movement between said second and third plates but permit rotational movement between said second and third plates and movement between said second and third plates in a direction normal to their facing surfaces, whereby sliding movement between said structure and said support is accommodated by sliding of said first and second plates in relation to each other and rotational movement between said bridge and said support is accommodated by rotation between said second and third plates while said elastomer pad is protected from excessive shear loads.

3,921,241
DOCKBOARD SUPPORT

Vernon O. Smith, Ashley, Ohio, assignor to Overhead Door Corporation, Dallas, Tex.

Filed Apr. 8, 1974, Ser. No. 458,572
Int. Cl.² B65G *11/00*
U.S. Cl. 14—71 **11 Claims**

1. In a dock leveler having support means, ramp means pivotally connected to said support means for pivotal movement between raised and lowered position, said ramp means being pivotal about a pivot axis adjacent the rear edge thereof, said ramp means having the front edge adapted for engagement with the floor of a carrier disposed in a loading or unloading position adjacent a dock, the combination comprising:
safety stop means coacting between said ramp means and said support means for preventing said ramp means for pivoting downwardly below a plurality of selected predetermined positions, said stop means including abutment means mounted on said support means and positioned under the front edge of said ramp means;
said stop means including first elongated leg means pivotally supported on said ramp means beneath and near the front edge of said ramp means for swinging movement about a horizontal axis between a first position engageable with said abutment means, whereby the front edge of said ramp means is supported at a first level, and a second position spaced laterally from said abutment means for permitting said ramp means to swingably move downwardly from said first level;
said stop means also including second elongated leg means pivotally supported on said ramp means beneath and near the front edge of said ramp means for swinging movement about a horizontal axis between a first position engageable with said abutment means, when said first leg means is in its second position, whereby the front edge of the ramp means is supported at a second level below said first level, and a second position spaced laterally from said abutment means for permitting downward swinging movement of said ramp means below said second level;
said first and second leg means each having their upper end portions pivotally connected to said ramp means so that said first and second leg means are each suspended downwardly below said ramp means and are biased solely by gravity toward their respective first positions; and
actuating means connected to said first and second leg means and operable for individually and selectively swinging said first and second leg means into their respective second positions so that the front edge of said ramp means can move downwardly below said first and second levels as said first and second leg means are respectively swung into their second positions.



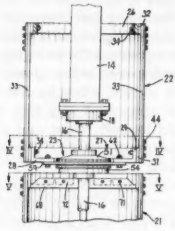
3,921,242
WINDOW BRUSH

Gaylord J. Clark, P.O. Box 216, Coloma, Mich. 49038

Filed Feb. 27, 1974, Ser. No. 446,216
Int. Cl.² B60S *3/06*
U.S. Cl. 15—21 D **11 Claims**

1. In a rotary brush construction, particularly for washing a vehicle, having a substantially cylindrical rotatable brush means and rotatable drive shaft means extending substantially coaxially of said brush means and drivingly coupled thereto, the improvement comprising torque limiting clutch means drivingly connecting said brush means to said shaft means for permitting slippage of said brush means relative to said shaft means when the external torque imposed on said brush means exceeds the torque transmitting capacity of said clutch means, said drive shaft means and said brush means being oriented

with the rotational axes thereof extending substantially vertically, and said clutch means constituting the sole structure for



both rotatably driving and supporting said brush means in a selected axial position relative to said shaft means.

3,921,243

VEHICLE CLEANING APPARATUS

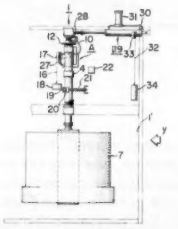
Shigeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 3, 1974, Ser. No. 412,434

Claims priority, application Japan, May 31, 1973, 48-60306

Int. Cl.[2] B60S *3/06*

U.S. Cl. 15—21 D **3 Claims**



1. A vehicle cleaning apparatus comprising: a frame structure portally shaped to allow passage therethrough of a vehicle to be cleaned, a first swing arm swingably mounted on a first vertical support shaft supported on each of the two side columns of said frame structure, a second swing arm firmly secured at one end to a second vertical support shaft rotatably carried by said first support arm for swinging movement about the axis of said second support shaft relative to said first swing arm, a rotatable cylindrically shaped side brush suspended vertically from the other end of said second swing arm, motor means for rotating said side brush, a first sprocket wheel rotatably mounted on said first support shaft, a second sprocket wheel fixed to said second support shaft, an endless chain belt entrained around said sprocket wheels, means for biasing said first and second swing arms into an extended position substantially at right angles to the path of the vehicle, and means connected to said first sprocket wheel for damping or slowing the turning of said first sprocket wheel in one direction while allowing it to turn freely in the other direction.

3,921,244

FLOOR BUFFER

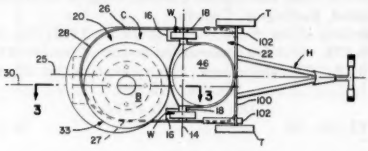
Loring Ferdinand Warren, 247 Bailey Road, Pittsburg, Calif. 94565, and William George Chappius, 59 The Trees Drive, Concord, Calif. 94518

Filed Oct. 15, 1973, Ser. No. 406,517

Int. Cl.[2] A47L *11/162*

U.S. Cl. 15—98 **2 Claims**

1. An improved floor buffer for operator directed polishing of a floor comprising: a carriage disposed substantially horizontally to said floor having a lower surface exposed to said floor and an upper surface exposed away from said floor; a handle attached to said carriage at the end of said carriage extending angularly upward and away from said carriage toward said operator overlying a longitudinal axis along said carriage; at least two wheels rotatably mounted to said carriage along an axis transverse of said carriage substantially normal to the longitudinal axis of said handle, said axis along which said wheels are mounted dividing said carriage into a forward portion and a rearward portion; a buffer mounted to said carriage for rotation about a vertical axis at said forward portion and extending below said lower surface to confront said floor, said buffer extending a distance below said lower surface of said carriage which is substantially the same as the distance of the lowest point of said wheels below said carriage



whereby downward and upward rotation of the rearward portion of said carriage by said handle produces correspondent upward and downward confrontation of said buffer to said floor, said buffer being displaced to the right of said longitudinal axis as viewed from positions overlying said buffer and said floor, and said buffer rotates clockwise as viewed from positions overlying said buffer and said floor; a butane powered engine mounted to said carriage; means for transmitting power from said butane powered engine to said buffer, said power transmission means including a centrifugal clutch for permitting said buffer when in contact with said floor to not rotate at low operating speeds of said engine, to rotate at high operating speeds of said engine, and to operate at adjustable speeds between said low operating speed and said high operating speed of said engine.

3,921,245

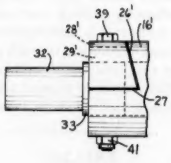
CYLINDRICAL BRUSH WITH STUB SHAFT SUPPORT

Gaylord J. Clark, 4679 Paw Paw Lake Road, Coloma, Mich. 49038

Filed Sept. 30, 1974, Ser. No. 510,751

Int. Cl.[2] A46B *13/02*

U.S. Cl. 15—179 **10 Claims**



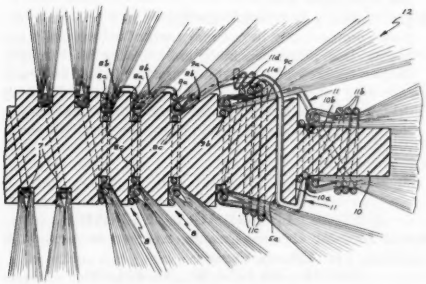
1. In combination, a rotary brush, a pair of bearing means positioned adjacent the opposite ends of said rotary brush, and shaft means connencted between said rotary brush and said pair of bearing means, whereby said rotary brush is supported for rotation about its axis, comprising the improvement wherein said shaft means includes stub shaft connecting means connected to one end of said rotary brush and coacting with an adjacent one said bearing means, said stub shaft connecting means including a stub shaft having a first shaft portion rotatably supported within said one bearing means and a second shaft portion spaced from said first shaft portion and fixedly connected to said rotary brush, said rotary brush having a sleevelike hub provided adjacent at least one end

thereof and defining therein an opening, said sleevelike hub having a recess formed therein and extending axially inwardly from the free end thereof, said recess extending circumferentially of said hub through a sufficient distance so as to have a minimum width at least equal to the cross-sectional dimension of said second shaft portion, a separable portion adapted to be positioned within said recess so as to substantially occupy same, said separable portion cooperating with said hub so as to define said opening when said separable portion is disposed within said recess, said second shaft portion being positionable within said opening so as to be surrounded by said hub and said separable portion, and fastener means fixedly interconnecting said hub, said second shaft portion and said separable portion in fixed relationship relative to one another.

3,921,246
BRUSH CONSTRUCTION

Franklin D. Pichelman, Minneapolis, Minn., assignor to Flo-Pac Corporation, Minneapolis, Minn.

Filed Aug. 28, 1974, Ser. No. 501,047
Int. Cl.² A46B 3/16
U.S. Cl. 15—207 **6 Claims**

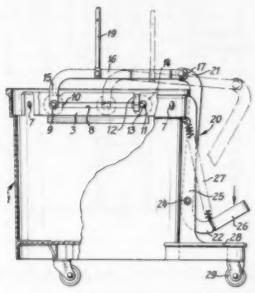


1. A brush comprising,
a. an elongated handle made from molded plastic material and having
b. a plurality of longitudinally spaced apart circumferential bristle receiving grooves each having a generally V-shaped cross section, at least certain of said grooves having:
   1. a rear shoulder generally normal to the axis of the handle,
   2. a forwardly extending bristle engaging and positioning surface, and
   3. a circumferential wire-receiving and achoring recess formed in said forwardly extending surface,
c. a bristle holding wire having at least three convolutions wound in each groove:
   1. a bristle holding convolution having bristles clamped thereunder,
   2. an anchoring convolution underlying said bristle-holding convolution and received in the recess to prevent said wire from slipping on the handle, and
   3. a bristle positioning convolution overlying said bristles and holding the same at the desired angle of divergence to the axis of the handle.

3,921,247
MOP WRINGER ATTACHMENT FOR A BUCKET

Leslie George Cook, Wimbledon, London, England, assignor to Straight Jane Mops Limited, Wimbledon, London, England

Filed Feb. 22, 1974, Ser. No. 445,305
Claims priority, application United Kingdom, Mar. 2, 1973, 10356/73
Int. Cl.² A47L 13/60
U.S. Cl. 15—262 **1 Claim**



1. A bucket incorporating a mop wringer attachment, such attachment comprising parallel guide rails extending across the upper part of the bucket interior, an elongate movable wringing element extending between the rails and movable along the rails, a fixed wringing element extending between the rails, a doubly cranked generally S-shaped lever incorporating an operating pedal at one end, a horizontally-disposed pivot pin extending through the bend of the S-shaped lever adjacent the end incorporating the pedal and fixed structure on the lower part of the bucket wall, a linkage between the upper end of the lever and the movable wringing element whereby depression of the pedal causes the movable wringing element to move in the wringing direction towards the fixed wringing element, spring means opposing depression of the pedal, a stabilising foot extending radially outwardly from the bucket wall and positioned under the pedal both in the depressed and in the raised condition of the latter, and caster wheels, on the underside of the bucket, one of which is under the foot.

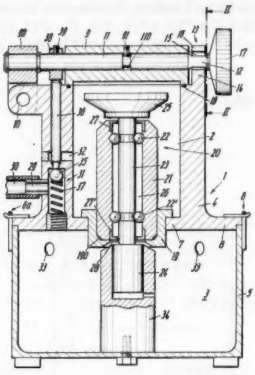
3,921,248
APPARATUS FOR REMOVING EXCESS LUBRICANT FROM ANTIFRICTION BEARINGS

Rudolf Effenberger, Munchingen; Stefan Müller, Asperg, and Heinz Reinhardt, Stuttgart, all of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed Apr. 10, 1974, Ser. No. 459,617
Claims priority, application Germany, Apr. 19, 1973, 2319864
Int. Cl.² A47L 5/38
U.S. Cl. 15—304 **13 Claims**

1. Apparatus for removing excess lubricant from an antifriction bearing comprising a housing having an intermdiate wall dividing said housing into two hollow chambers, one of said chambers being sealed against opening to atmosphere and the other chamber forming a container for receipt of lubricant and being open to atmosphere, means for mounting an anti friction bearing in said intermediate housing wall said mounting means providing an opening to the one chamber open to the atmosphere and the other end extending outwardly therefrom into the sealed chamber, means mounted in the wall of the sealed chamber for impressing a gaseous media into said sealed chamber to cause a flow of gaseous media axially through an anti friction bearing mounted in the bearing

mounting means and expel a lubricant into said chamber open to the atmosphere and said sealed chamber including valve



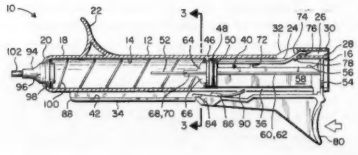
means for manually controlling the amount of flow of a gaseous media into said sealed chamber.

3,921,249

MINIATURE VACUUM STROKE CLEANING IMPLEMENT

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91202

Filed June 24, 1974, Ser. No. 482,223
Int. Cl.[2] A47L 5/02, 5/24
U.S. Cl. 15—341 **8 Claims**



1. A solder removing implement comprising:

a molded body having a cylinder, air pump portion and forward and rearward ends, said rearward end being substantially open;

a guide channel carried by said body and disposed along said cylindrical portion externally thereof, said body being formed to define a guide slot aligned with said guide channel and extending from said rearward end forwardly for a predetermined length along said cylinder portion;

tip means carried by said body contiguously to its said forward end and forming a nozzle for air flow communication between the external environment and said cylinder portion;

a molded piston assembly carried by said body and including integrally;

a piston element disposed axially slidably within said cylinder portion of said body in air pump relation therewith,

a cleaning rod element extending forwardly of said piston element for cleaning said nozzle when said piston assembly is displaced forwardly toward said forward end of said body,

a circular guide boss element disposed axially slidably in said cylinder portion and spaced axially rearwardly from said piston element,

a cocking handle portion for urging said piston assembly forwardly in said cylinder portion and extending radially from said guide boss element externally of said body and disposed axially slidably in said guide slot,

a guide trigger tongue element extending forwardly from said cocking handle portion and disposed slidably, laterally and radially captively, within said guide channel means of said body,

first trigger-latching means carried by said tongue element and disposed contiguously to the forward end thereof;

second trigger-latching means carried by said body and disposed contiguously to the forward end of said guide channel thereof,

said first and second trigger-latching means being of the character cooperatively to engage and latch said piston assembly forwardly in said cylinder portion of said body when urged to such disposition by operation of said cocking handle portion of said piston assembly,

said first and second trigger-latching means being further of the character to be selectively disengaged to permit, when desired, rearward displacement of said piston assembly;

energy storage means carried within said body and connected between said piston assembly and said body and against which work is done when said piston assembly is urged forwardly by said operation of said cocking handle portion and which causes a rapid, vacuum stroke flyback of said piston assembly when said trigger-latching means are disengaged; and

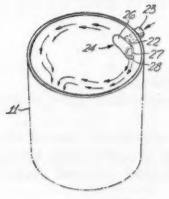
piston assembly stop means carried by said body and disposed contiguously to the rear thereof for normally engaging said piston assembly and limiting its rearward displacement along said cylinder portion of said body and including stop means control element for selectively disengaging said piston assembly to permit, when desired, the removal rearwardly of said piston assembly from said body.

3,921,250

SUCTION CLEANER AIR INLET DEVICE

Bohumil Jerabek, Ottawa, Canada, assignor to Jerabek & Associates Ltd., Ottawa, Canada

Filed May 29, 1974, Ser. No. 474,470
Int. Cl.[2] A47L 9/10
U.S. Cl. 15—353 **3 Claims**



1. An air inlet device for a tank type suction cleaner having a vertical tank with an air inlet opening in a wall thereof, comprising

means for engaging the tank wall at said opening,

deflecting means within said tank supported by said means for engaging the tank wall at said opening, said deflecting means extending substantially horizontally in both directions to deflect the incoming air in two substantially opposed directions, said deflecting means comprising a generally semi-cylindrical member with the curved portion spaced inwardly from said opening and the terminating portions of said member extending in a direction towards the wall of said tank, a lower edge of said deflecting means, where air is discharged from said deflecting

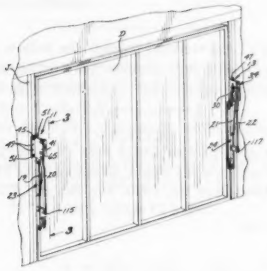
means, having a lip inclined slightly upwardly to give an upward inclination to the path of the discharged air.

3,921,251

OVERHEAD DOOR HINGE APPARATUS HAVING MICROADJUSTMENT

Donald D. Andresen, 10380 W. Whitesbridge Ave., Fresno, Calif. 93706

Filed Apr. 8, 1974, Ser. No. 458,800
Int. Cl.² A47G *1/10*; E05B *1/00*; E05F *1/00*
U.S. Cl. 16—1 **9 Claims**



1. An overhead door hinge apparatus comprising:

a door jamb bracket for mounting on a door jamb;

a door bracket for mounting on a door at a point below said jamb bracket;

first and second hinge arms of different lengths and pivotally connected at their respective upper extremities at spaced apart points to said jamb bracket and at their respective lower extremities at spaced apart points to said door bracket;

flange means carried from said jamb bracket and inclined downwardly and in one direction, said flange means including first locator means extending vertically therealong and having selected locations therealong;

a microadjustment bracket carried from said flange means and including a mount engagable at different selected locations along said locator means; and

tension means connected on one end with said microadjustment bracket and on its opposite end with said door bracket at a point spaced transversely from said flange means in the direction opposite the direction of downward inclination of said flange means whereby said door jamb bracket may be mounted from a door jamb, said door bracket mounted from a door, said microadjustment bracket engaged at a selected position with said locator means to cause said tension means to apply the desired tension to said door bracket for assisting in the raising of said door.

3,921,252

HINGE ASSEMBLY FOR A DISHWASHER DOOR

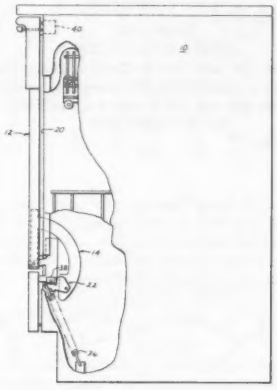
Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 29, 1974, Ser. No. 464,894
Int. Cl.² E05D *11/08*; F23M *7/00*
U.S. Cl. 16—142 **4 Claims**

1. In a dishwasher having a latchable door pivotally movable between a closed position and a fully open position, a hinge arm having first and second end portions and being connected at the first end portion to the door and extending outwardly therefrom, and a spring associated with the hinge arm for exerting forces on the door through said hinge arm, the improvement comprising:

a cam pad connected to the appliance at a location adjacent the second end portion of the hinge arm in the closed position of the door; and

a selector element having first and second end portions, first and second side portions, a cam surface on the first side portion and a stop element on the second side portion, said selector element being connected at the first end portion to the spring and pivotally connected at the second end portion to the second end portion of the hinge arm, said selector element being of dimensions sufficient



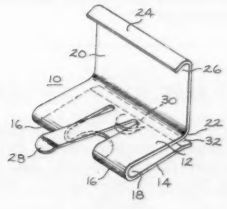
for contacting the cam pad with the cam surface and exerting an opening force through the hinge arm on the door, the opening force resulting from a biasing force of the spring in the closed position of the door, whereupon unlatching of the door allows said selector element to pivot until the stop element contacts the second end portion of the hinge arm, thereby opening the door a preselected distance.

3,921,253

FASTENING DEVICE FOR HINGEDLY ASSEMBLING MEMBERS

Charles W. Nelson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 1, 1974, Ser. No. 447,150
Int. Cl.² E05D *1/06*; A47F *5/00*
U.S. Cl. 16—172 **6 Claims**



1. In a cabinet having a base member and a top member, a fastening device for hingedly connecting said members to each other, the fastening device comprising:

a pair of spaced legs interconnected at adjacent ends to define a generally U-shaped section for receiving a portion of said base member;

a third leg interconnected with a first of the spaced legs at a free end thereof to form substantially a right angle therebetween, the third leg including an inwardly-extending hinge section formed on a free end thereof engaged in an aperture in said top member for allowing hinged movement of the top member with respect to the base member;

a resilient tongue associated with one of the spaced legs in engagement with the top member to provide a tight connection between the fastening device and the top member; and

means associated with one of the spaced legs in engagement with the base member securing the fastening device to the base member.

3,921,254

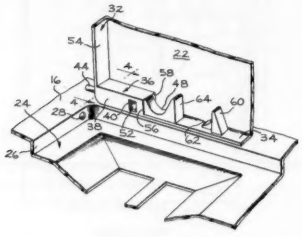
HINGE STRUCTURE

James R. Foster, Jr., and Ved P. Gakhar, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 10, 1975, Ser. No. 548,546

Int. Cl.² E05D *1/06*

U.S. Cl. 16—176 **7 Claims**



1. A hinge structure for pivotally connecting and disconnecting a first and second member at a pivot axis including a first hinge portion attached to the first member, a second hinge portion on the second member in axial alignment with said first hinge portion at said pivot axis, said first hinge portion comprising:

a. a pin support member defining a hinge pin hole therethrough having a non-circular cross section;

b. a pin element axially insertable into the hinge pin hole and having at one end a pivot section for pivotal connection to the second hinge portion, a central portion having a non-circular cross section and non-rotatable with the pin support member when inserted therein, and a manual release finger tab portion, and

c. a finger grip member spaced from and in axial alignment with the pin element.

3,921,255

METHOD FOR EVISCERATING POULTRY AND THE LIKE

Joseph A. LaBarber, Kern City, Calif., assignor to Nebraska Technical Equipment Company, Aurora, Nebr.

Continuation-in-part of Ser. No. 265,953, June 23, 1972, Pat. No. 3,786,535. This application Apr. 17, 1973, Ser. No. 351,906

Int. Cl.² A22B *3/08*, *21/00*

U.S. Cl. 17—11 **12 Claims**

1. A method for eviscerating poultry and the like comprising the steps of:

a. inserting a hollow probe member through the vent into the main intestine of a poultry carcass,

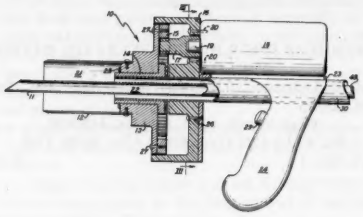
b. drawing a vacuum through said hollow probe to remove waste from said main intestine,

c. forming a closed annular zone aroung said vent,

d. drawing a vacuum within said annular zone,

e. cutting the carcass of the poultry along the periphery of the annular vacuum zone while the vacuum is being drawn therein,

f. separating the anus and alimentar / canal from the poultry carcass after the cutting step has been completed, and



g. blowing a fluid material through the hollow probe member and vacuum zone to remove the anus and alimentary canal from the probe member and annular zone.

3,921,256

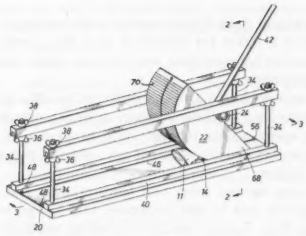
METHOD AND APPARATUS FOR CLEANING CRABS

Otto H. Huebotter, 4111 Floyd, Houston, Tex. 77007

Filed Sept. 13, 1974, Ser. No. 505,723

Int. Cl.² A22C *29/02*

U.S. Cl. 17—71 **10 Claims**



1. A method of removing the edible meat from the shell of an uncooked crab comprising cutting the crab body into two halves along its longitudinal axis, removing the pinchers, cleaning each half, and squeezing each half of the crab progressively toward the longitudinal axis along which the crab was cut to extrude the raw meat from the shell of the crab.

3,921,257

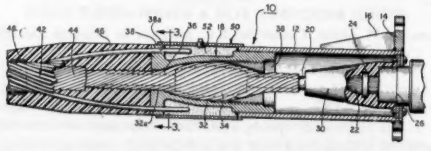
APPLIANCE FOR LINEAR BODIES

Harry Allen Appleby, Cleveland, and Frank Albert, Jr., Parma, both of Ohio, assignors to Preformed Line Products Company, Cleveland, Ohio

Filed Dec. 18, 1973, Ser. No. 425,884

Int. Cl.² F16G *11/03*, *11/04*

U.S. Cl. 24—122.6 **10 Claims**



1. A termination appliance for a load bearing cable, comprising:

cable gripping means comprising a housing member having an aperture for receiving said cable;

support means secured to said housing and disposed radially outwardly of said aperture;

helical rod means comprising a plurality of helically preformed rod elements each having one end in engagement

with said support means at a respective peripheral location of said support means spaced a predetermined angular interval from an adjacent location and spaced a substantial distance radially outwardly of said cable, a portion of said rod elements extending forwardly from said support means and tapering into a helically wrapped engagement with said cable for alleviating bending fatigue on said cable at the point of exit of said cable from said housing; and

means engaging the forwardly extending portions of said rod elements for reinforcing said helical rod means, said reinforcing means including a resilient plastic-like material in which said forwardly extending portion of said rod elements is encased.

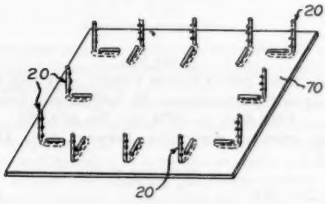
3,921,258
ASYMMETRICAL SELF-GRIPPING DEVICE

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., New York, N.Y.

Division of Ser. No. 374,715, June 28, 1973, abandoned, which is a continuation of Ser. No. 171,701, Aug. 13, 1971, abandoned. This application Nov. 4, 1974, Ser. No. 520,692

Int. Cl.² A44B *17/00, 21/00*

U.S. Cl. 24—204 6 Claims



1. An assembly comprising a asymetrical self-gripping one piece device and a sheet member, said device comprising a substantially straight base member positioned substantially entirely on one face of said sheet and in contact therewith, holding member extending from an end of said base member penetrating through said sheet member and bent over and extending toward the other end of said base member and engaging the other face of said shut member thereby clamping said shut member against said base member, an upright straight gripping member, extending from said other end of said base member, penetrating through said sheet member to the other side of said sheet member, said gripping member being substantially perpendicular to said sheet member, said gripping member including a series of barb-line elements deformed out of said gripping member along its length and said gripping member being adapted to remain upright for self-gripping engagement with a receiving layer.

3,921,259
SELF-GRIPPING DEVICE WITH COMPOSITE GRIPPING ELEMENTS

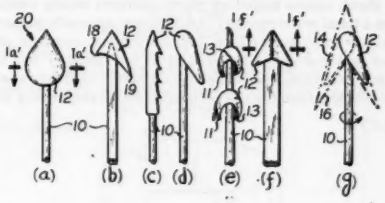
George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., New York, N.Y.

Continuation of Ser. No. 396,641, Sept. 12, 1973, which is a continuation of Ser. No. 166,955, July 28, 1971. This application Nov. 21, 1974, Ser. No. 525,908

Int. Cl.² A44B *17/00*

U.S. Cl. 24—204 4 Claims

1. Self-gripping device comprising a multiplicity of composite gripping elements attached in an upright fashion to a base member, each of said composite gripping elements comprising an upright shaft having tensile and impact strengths and a modulus of elasticity such that it substantially retains its upright position when shearing, tensile or compressive forces are applied thereto, said shaft having permanently attached at its upper end a distinct and separate head element made of a different material than said shaft, said head element comprising a barb extending from said upper end downwardly toward said base member at a generally acute angle to said shaft and having a penetrating and gripping shape which describes at



least one outer cone when rotated about the vertical axis of said shaft and which is adapted to enter and become lodged in a receiving surface, said head being further characterized as having a degree of hardness and a mass so as to facilitate penetration into a receiving surface upon connection therewith.

3,921,260
COUPLING ELEMENT FOR SLIDE FASTENER

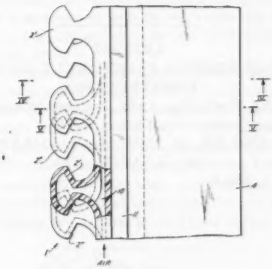
Alfons Frohlich, Essen, Germany, assignor to Opti-Holding AG, Glarus, Switzerland

Filed Apr. 9, 1973, Ser. No. 349,004

Claims priority, application Germany, Apr. 7, 1972, 2216831

Int. Cl.² A44B *19/14*

U.S. Cl. 24—205.13 D 4 Claims



1. A coupling element for a slide fastener, comprising an elongate seamless body of thermoplastic material with a throughgoing channel bounded by a wall which defines a longitudinal edge of said body, said wall being provided with hollow deformations of undercut profile whose interior is open toward said channel and which form heads longitudinally spaced along said edge for mating engagement with complementary deformations on a similar coupling element juxtaposed therewith.

3,921,261
FASTENER

Julian Vernon Fisher, Carpentersville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

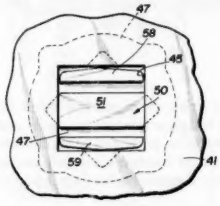
Filed Nov. 18, 1974, Ser. No. 525,001

Int. Cl.² A44B *21/00*; F16B *13/06*

U.S. Cl. 24—221 R 13 Claims

1. A fastener for attachment to a wall having a face and a back, the wall defining a polygonal hole of predetermined size, shape and thickness, the fastener comprising a head having face means adapted for abutment against the wall face, base

means including one or more elements extending from the fastener face means and located on the fastener face means to extend into said wall hole and abut opposed sides adjacent corners of said hole to prevent translational and rotational movement of the fastener relative to the hole in a direction parallel to the plane of said hole, the fastener further comprising shank means including planar element means extending from a basal end outwardly in a direction generally perpendicularly to the fastener face, and having two opposed planar faces oriented generally parallel to one another but transversely extending and being spaced perpendicularly apart by amounts less than the distance between corresponding planar



sides defining the wall hole to permit insertion of the planar element through the wall hole, each planar face being joined to the fastener by a central stem portion of reduced transverse dimension, thereby providing at least one flexible shoulder extending in opposite directions, at least part of the unflexed shoulder being spaced from the fastener face by a distance equal to or less than the hole thickness so as to permit the fastener base means to be positioned within the hole and to secure the fastener in a direction perpendicular to the plane of the hole so as to prevent movement of the fastener relative to the hole in a direction perpendicular to the plane of the hole.

3,921,262

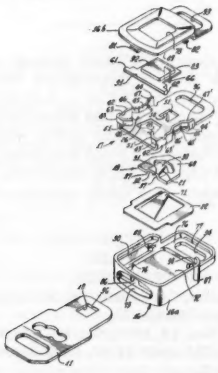
LOAD BEARING SAFETY BELT BUCKLE CONSTRUCTION

Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Feb. 26, 1974, Ser. No. 445,838

Int. Cl.² A44B *11/26*

U.S. Cl. 24—230 A **1 Claim**



1. In a safety buckle for receiving and engaging a tongue plate, the buckle including a non-load bearing housing surrounding a through-load member adapted to be connected at one end to a safety belt strap and having a latch member movable relative to the member for releasably engaging the tongue plate to the member, the member having a base plate and restraint means for laterally and transversely restraining the tongue plate in a plane adjacent and overlying the member base plate, the improvement in through-load member and its associated restraint means comprising the provision of:

guide means on said through-load member including opposed side wall flanges on said base plate forming a channel for receiving said tongue plate, each including portions extending into said channel thereof overlying and vertically spaced from the leading edge of the said member base plate for guiding the entry of said tongue plate into said buckle and for holding it laterally and transversely of said member at the forward end of said member;

a pair of opposed upstanding second side wall flanges on said base plate spaced rearwardly of said guide means; and

a tongue plate anchoring means including a bar-like member extending between said side wall flanges on each side of said base plate, and extending into said channel and spaced above said base plate, to overly forward side marginal areas of the tongue plate, when the latter is inserted in said buckle, for also holding said tongue plate laterally and transversely of said member.

3,921,263

FASTENING DEVICE FOR TUBES AND THE LIKE

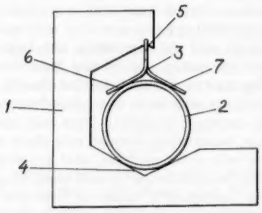
Eilif Elvegaard, Karstensensvei 30, 1660 Lisleby, Norway

Filed Apr. 11, 1974, Ser. No. 459,932

Claims priority, application Norway, Apr. 13, 1973, 1562/73

Int. Cl.² A44B *21/00*

U.S. Cl. 24—263 **4 Claims**

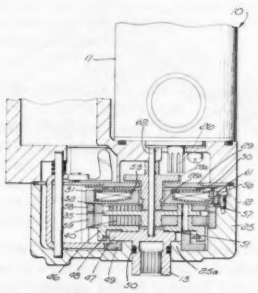


1. A device for fastening of tubes, conduits and the like, comprising a holder element and a clamp element with a resiliently yieldable intermediate portion between a tube contacting part and a fixing part which is adapted to be clamped by wedge action to a corresponding fixing part on the holder element, wherein the holder element is a rigid plate provided with an outwards open cut-out with an essentially V-formed tube contacting part and at least one esentially opposite fixing part, variable clamping of the clamp element between a tube placed in the cut-out and a fixing part on the holder element being achieved by relative movement between a fixing part on one element, the fixing part being suitably selected for the actual tube dimension, and a wedge-surface-forming guiding edge on the other element, the guiding edge being provided with barb means for securing of the clamp element in desired position.

3,921,264
ELECTRICALLY OPERATED ROTATIONAL ACTUATOR WITH FAILSAFE DISENGAGEMENT

Vahe S. Madonian, La Puente, and Peter I. O. Keskine, Van Nuys, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 8, 1974, Ser. No. 486,302
Int. Cl.² F16H *3/44, 57/10*
U.S. Cl. 74—785 10 Claims

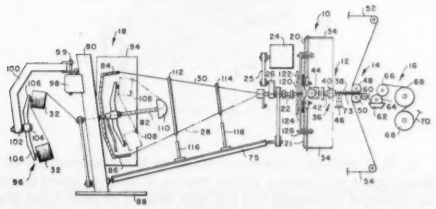


1. A rotational actuator having an output shaft for effecting angular motion through a predetermined angle in at least one angular sense, comprising:
- a drive motor having a shaft which rotates in response to a solenoid operated applied electrical power signal;
- a first reduction gear assembly having input and output shafts, and including at least one rotatably mounted ring gear, at least one planetary gear subassemblies each including a rotatably mounted disc and at least one planetary gear rotatably mounted thereon, said planetary gears each engaging the teeth of said ring gear;
- means including a sun gear engaging each planetary gear on said disc to couple said drive motor to said gear assembly, and means mechanically coupling said disc to said output shaft;
- and engagement means comprising an electro-mechanical device for providing mechanical locking of said ring gear to prevent its rotation, said engagement means operating in response to an electrical control signal applied to the magnetizing coil of said solenoid.

3,921,265
METHOD AND APPARATUS TO PRODUCE NON-WOVEN FABRIC

Paul W. Eschenbach, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Sept. 30, 1974, Ser. No. 510,437
Int. Cl.² D02G *3/00*
U.S. Cl. 28—1 CL 5 Claims

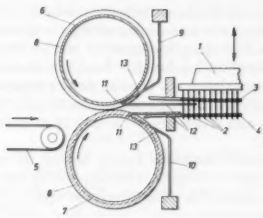


2. Apparatus to produce a non-woven fabric comprising: yarn support means including a pass of yarn supports spaced from one another, means for supporting a package of yarn, rotable yarn guide means operably associated with said pair of yarn supports to supply yarn from the yarn package support and to wind the yarn in an elliptical path about said pair of yarn supports at a substantially uniform velocity to form reaches therebtween and means to rotate said rotable yarn guide means.

3,921,266
NEEDLING MACHINE

Ernst Fehrer, Auf der Gugl 28, Linz, Austria

Filed Feb. 28, 1975, Ser. No. 554,136
Claims priority, application Austria, Apr. 1, 1974, 2703/74
Int. Cl.² D04H *18/00*
U.S. Cl. 28—4 R 3 Claims

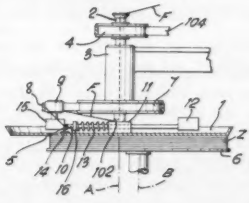


1. A needling machine, which comprises
- a perforated backing plate,
- a perforated stripping plate disposed over and vertically spaced from said backing plate to define a space therewith,
- a multiplicity of needles,
- means operable to move said needles up and down through said backing and stripping plates,
- upper and lower feed rollers forming a nip and operable to advance a non-woven web through said nip and toward said space, said upper feed roller being formed with annular grooves, and
- a plurality of juxtaposed rods, each of which comprises first and second legs and an apex portion at which said legs are joined and include an acute angle with each other, each of said rods extending into one of said annular grooves only with said apex portion on that side of said upper feed roller which faces said space, said first leg being fixed at a point spaced from said apex portion, said second leg extending from said apex portion into the proximity of the needles which are nearest to said feed rollers.

3,921,267
APPARATUS FOR PRODUCING A COILED THREAD PACKAGE

Renato Crotti, 71, Corso Canalgrande, Modena, Italy (41100)

Filed Sept. 10, 1974, Ser. No. 504,706
Claims priority, application Italy, Sept. 12, 1973, 12826/73
Int. Cl.² B65H *51/02, 55/00*
U.S. Cl. 28—21 4 Claims



1. An apparatus for producing a coiled thread package constructed of a continuous length of thread disposed in sub-

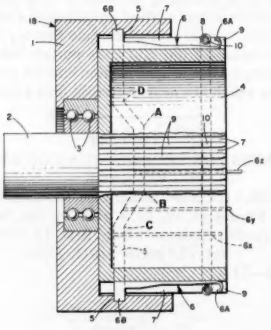
stantially annular layers forming a coil, each layer being constructed of a series of loops which progress along the annular layer of the coil, said apparatus comprising:

a. a receiving plate having a vertical axis;
b. a thread depositing disc arranged above said receiving plate and having a vertical axis, said axis of said depositing disc being arranged eccentrically with respect to the axis of the receiving plate, said receiving plate and said depositing disc being capable of relative movement toward and away from each other in vertical direction;
c. means for yieldingly urging the said receiving plate and the said depositing disc into relative movement towards each other;
d. means for rotating the said depositing disc around its axis;
e. further means for causing a relative movement between the axis of the depositing disc and the receiving plate;
f. a through bore on said depositing disc providing a passage for the thread to be deposited on the receiving plate;
g. a feeding device for the thread to be deposited on the receiving plate, said feeding device comprising:
   1. a pulley, arranged coaxially to the axis of the depositing disc and stationary with respect to the said depositing disc;
   2. a freely rotatable roller, having its axis of rotation parallel to the axis of the depositing disc and supported by means which are integral in rotation with the depositing disc;
   3. an endless flexible belt led, by its inner run, over said pulley and said roller, said thread being fed between said belt and said roller such that a portion of the thread is clamped in an arc between the belt and roller for a substantial portion of the circumference of the roller.

3,921,268
DEVICE FOR THE TEXTURIZATION OF SYNTHETIC THERMOPLASTIC CONTINUOUS FIBERS

Mario Caroglio, Verbania, Italy, assignor to Montedison Fibre S.p.A., Milan, Italy

Filed Oct. 25, 1973, Ser. No. 409,594
Claims priority, application Italy, Oct. 27, 1972, 31029/72
Int. Cl.² D02G *1/14*
U.S. Cl. 28—1.8 **6 Claims**

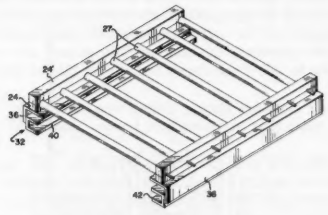


1. Apparatus for texturizing synthetic thermoplastic continuous filament yarns, consisting essentially of two hollow coaxial cylinders, one inside the other, of which the outer one is fixed and provided on its inside wall with an internal guiding groove, while the inner cylinder is rotatable and provided on its outer wall, and parallel to its axis, with slots within each of which an element ending in a yarn-engaging hook is freely slideable, the base of each element fitting in the internal guiding groove of the fixed outer cylinder, and whose motion depends on the configuration of the guiding groove, the guiding groove on the fixed outer cylinder being in the form of two circular arcs perpendicular to the axis of the two cylinders, and located at different levels and communicating with each other by oblique connecting flutes.

3,921,269
METHOD OF FABRICATING LARGE AREA CATHODE

Harry E. Smithgall, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 15, 1974, Ser. No. 488,534
Int. Cl.² H01J *9/02*
U.S. Cl. 29—25.14 **3 Claims**

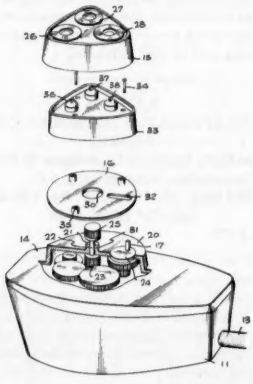


1. In a method of fabricating at least two area cathodes simultaneously, the steps of: positioning a mandrel at a winding station, said mandrel having opposed upper and lower surfaces each being provided with a pair of spaced apart grooves; positioning pairs of electrically conductive cathode side rods in said grooves; helically winding a cathode wire coated with electron emissive material around said mandrel and over said cathode side rods; removing said electron emissive material from said cathode wire where it overlies said side rods; fixing each turn of said wire to said side rods; and severing said wires at points between said upper and lower side rods to form at least two area cathodes.

3,921,270
ELECTRIC RAZOR HAVING AN OSCILLATING CUTTING HEAD

Douglas J. Upton, 18740 Devonshire, Northridge, Calif. 91324

Filed Sept. 27, 1973, Ser. No. 401,163
Int. Cl.² B26B *19/00*
U.S. Cl. 30—43.3 **1 Claim**



1. In a shaving apparatus including the combination of a housing for enclosing a motor means, a cutting means assembly adapted to engage and cut hair bristles or shafts and gear means operably interconnecting said motor means to said cutting means, the improvement which comprises:

a plate movably carried on said housing and fixly carrying said cutting means assembly thereon whereby said plate and said cutting means assembly move relative to said

housing as a unit in a predetermined path with respect to said housing;

driving means operably connected between said gear means and said plate for moving said plate and said cutting means assembly in said predetermined path in response to said gear means;

said driving means includes an elongated slot formed in said plate offset from its center and a pin carried by a selected one of said gear means projecting into said slot in slidable relationship with respect to said plate; and

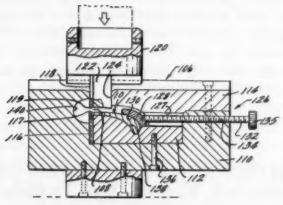
said pin carried on said selected gear off-center so as to move said plate and said cutting means assembly in said predetermined path which is defined as an arcuate continuous back and forth path.

3,921,271

AIR-COOLED TURBINE BLADE AND METHOD OF MAKING SAME

Ronald E. Dennis, Cincinnati, and William D. Treece, Forest Park, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 2, 1973, Ser. No. 320,522
Int. Cl.² B21K *3/04;* **B23P** *15/02*
U.S. Cl. 29—156.8 H **8 Claims**



1. In a method for making an air-cooled turbomachinery blade comprising the steps of:

forming into a final shape an airfoil having at least one hollow internal cavity and having a trailing edge with a plurality of openings therein for the efflux of air from the internal cavity, and

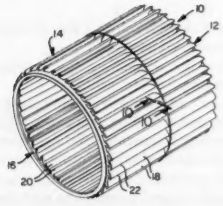
crimping only the trailing edge portion of the airfoil to a thickness at which a desired amount of air is flowing through said openings.

3,921,272

BLOWER WHEEL AND METHOD OF MAKING THE SAME

Stephen W. Klonoski, Torrington, Conn., assignor to Torin Corporation, Torrington, Conn.

Filed May 24, 1974, Ser. No. 473,124
Int. Cl.² B23P *15/02, 11/00*
U.S. Cl. 29—156.8 CF **10 Claims**



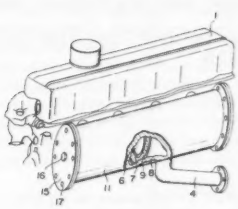
1. A method of making a blower wheel comprising the steps of providing an elongated blade strip including a longitudinally extending intermediate section and similar and opposite longitudinally extending narrow marginal sections, said intermediate section comprising a plurality of longitudinally spaced transversely extending similarly angularly inclined fluid moving blades, and said longitudinally extending marginal sections of said strip including continuous transversely inwardly disposed portions formed integrally with end portions of said fluid moving blades, providing a circular sheet metal member with an arcuate series of circumaxially spaced blade receiving openings communicating with its peripheral edge, each of said openings having an adjacent corner portion of said member which includes contiguous angularly related parts of an opening edge and said peripheral edge bent out of the plane of the member whereby substantially to enlarge the mouth of the opening and a major portion of its length, bending said blade strip about said circular member whereby respectively to enter said fluid moving blades in said enlarged blade receiving openings and thereby to form said strip to a cylindrical configuration with initially opposite end portions of said marginal sections in contiguous relationship, attaching together said contiguous end portions of said narrow marginal sections of the blade strip, and rebending said bent portions of said circular member at least approximately to the plane of said member whereby to secure said blades in their respective openings and to attach said member to said blade strip.

3,921,273

METHOD OF FILLING A CASING WITH HEAT INSULATING FIBERS

Katsumi Kondo; Fumiyoshi Noda; Mikio Murachi; Yuji Watanabe, and Masaru Usui, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 7, 1974, Ser. No. 512,872
Claims priority, application Japan, Oct. 9, 1973, 48-113457
Int. Cl.² B21D *53/00;* **B21K** *29/00;* **B23P** *15/26*
U.S. Cl. 29—157 **7 Claims**



1. Method of manufacturing a heat insulator which comprises the steps of introducing between an outer casing and an inner casing an insert comprising a mass of fibrous material which has been compressed by vacuum-packing it in a hermetically sealed bag, and then unsealing said bag to permit said material to expand within said casing.

3,921,274

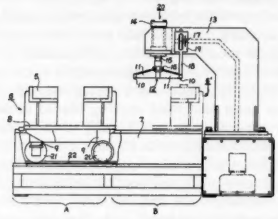
ASSEMBLING APPARATUS FOR SLIDING NOZZLE MOUNTED ON THE BOTTOM OF A LADLE

Tetsuya Yoshihara, Fukuyama; Hajime Sawada, Kawasaki, and Tetsuo Watanabe, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha; Kokankikai Kogyo Kabushiki Kaisha and Tokyo Yogyo Kabushiki Kaisha, all of Tokyo, Japan

Filed Jan. 14, 1975, Ser. No. 540,926
Claims priority, application Japan, Jan. 25, 1974, 49-10221
Int. Cl.² B23P *19/00*
U.S. Cl. 29—200 R **1 Claim**

1. An assembling apparatus for refractory component parts of a sliding nozzle mounted on the bottom of a ladle comprising a carriage having a rest for securely mounting thereon a metal holder for a refractory bottom plate or a refractory sliding plate of said sliding nozzle, a frame having an assembling station and a clamped condition check station and adapted for mounting thereon said carriage to be movable without rolling between and stoppable at either of said stations, expansion means adapted for directly supporting the

body portion of said carriage on said frame at least at said clamped condition check station thereof, and pressure means disposed above said clamped condition check station of said frame and including a pressure member suspended through a spherical seat bearing from one end of a rod of a hydraulic



cylinder carried on a beam mounted on said frame, said pressure member having a plurality of radial arms each thereof provided on the front end lower surface thereof with a pin of a predetermined raised dimension, one of said radial arms provided with a rotation stopper rod having a pointer and fitted into a rotation stopper holder attached to said beam.

3,921,275

COMBINED WIRE-STRIPPING AND WRAPPING TOOL

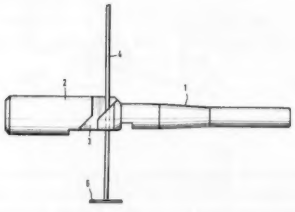
Walter Hartl, Winnenden, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,030

Claims priority, application Germany, June 28, 1973, 2332992

Int. Cl.² H01R *43/00*; B21F *3/04*

U.S. Cl. 29—203 H **1 Claim**



1. A wire stripping and wrapping tool bit comprising in combination:

a wrapping sleeve part,

a shaft part, said shaft part having an insertion slot passing through the longitudinal axis thereof and extending to a depth slighlty greater than the center of the axis of said tool bit; and

said insertion slot having an L-shaped cross-section and said slot being widened by extending in a funnel-shaped manner from the center of the axis toward both sides, and being arranged slantingly in relation to the transverse axis of the wrapping sleeve part.

3,921,276

DEBRIS EJECTING MEANS FOR PIERCE NUT APPLYING TOOL

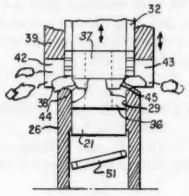
Daniel V. Oaks, Sterling Heights, Mich., assignor to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

Filed Sept. 16, 1974, Ser. No. 506,325

Int. Cl.² B23P *19/04*

U.S. Cl. 29—208 D **9 Claims**

1. An application tool for punching the pilot portion of a flanged pierce nut through a workpiece by forcing the nut and workpiece against a supporting die, comprising: a housing, a punch reciprocable in the housing for engaging a nut therein and forcing its pilot portion through an underdisposed workpiece, the housing having a first opening aligned with the punch for guiding and affording passage of successive flanged nuts to a workpiece, said opening being susceptible to the



accumulation of nut debris generated by preceding operations of the tool, said housing also having a side opening therethrough openly communicating laterally with said first opening, and means on said housing for positively ejecting said debris through said side opening to prevent the accumulation thereof in said first opening.

3,921,277

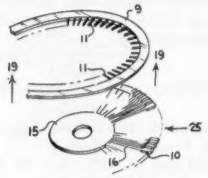
METHOD OF MAKING PRINTING DISC

Herbert Tramposch, Riverside, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 8, 1973, Ser. No. 413,783

Int. Cl.² B23P *17/00*

U.S. Cl. 29—418 **10 Claims**



9. A method of making a printing disc for use in a printing apparatus; comprising the steps of:

A. molding a first disc shaped member having a plurality of radially extending flexible arms;

B. molding a second member having a general annular configuration, and including a plurality of interconnected radially extending character printing types, the number and relative positions of said printing types corresponding to that for the number of radially extending flexible arms;

C. securing said second member to said first member by connecting each of said printing types about respective corresponding outer ends of each of said flexible arms; and

D. severing said second member at a plurality of points so that each of said character types is capable of independent movement with its associated arm through a printing stroke.

3,921,278

METHOD AND APPARATUS FOR REMOVING ROLL FILM FROM CASSETTES

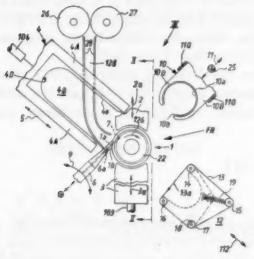
Prithwis Basu, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 3, 1974, Ser. No. 485,734

Claims priority, application Germany, July 12, 1973, 2335453

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 27 Claims



1. A method of removing photographic film from containers of the type wherein the film is convoluted on a core which is confined in and is rotatable relative to a substantially cylindrical deformable shell with a longitudinally extending mouth for the passage of film and wherein the ends of the shell carry apertured end walls which afford access to the core and at least one of which is detachable from the shell, comprising the steps of deforming the shell to thereby reduce the width of the mouth; detaching the one end wall from the deformed shell; rotating the core in a direction to collect the film thereon; simultaneously holding the film against clockspringing in the shell; and removing the film from the shell including effecting a relative axial movement between the core and the shell so that the film leaves the shell with the core through that end of the shell which becomes exposed in response to detachment of the one end wall therefrom.

3,921,279

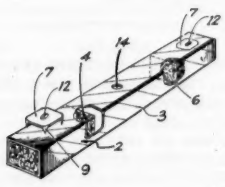
METHOD FOR MAKING A SUPPORT FOR AN OBJECT

Thomas G. Daley, 9716 Lanesboro Way, Louisville, Ky. 40222

Filed Aug. 20, 1974, Ser. No. 498,962

Int. Cl.² B23P *3/00, 25/00*

U.S. Cl. 29—458 5 Claims



1. A method for making a support for an object comprising the steps of: preparing a hollow member for addition of a resilient foam mix therein; adding said resilient foam mix into spaced preselected portions of said hollow member; curing said resin mix to form a resilient foam support within selected portions of said hollow member; and, adding object mounting means at selected points of the foam filled said preselected portions along the top outer surface of said hollow member.

3,921,280

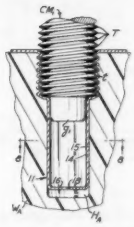
METHOD OF FORMING AN INSERT IN A WORKPIECE FOR RECEIVING A THREADED FASTENER

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342

Continuation-in-part of Ser. No. 268,478, July 3, 1972, Pat. No. 3,835,615, which is a continuation-in-part of Ser. No. 33,281, April 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 711,368, March 7, 1968, abandoned. This application Sept. 6, 1973, Ser. No. 394,923

Int. Cl.² B21D *39/00;* B23P *11/02*

U.S. Cl. 29—509 2 Claims



1. A method of forming an insert in a work piece for receiving a threaded fastener therein comprising the steps of:

a. forming a hole in the work piece with internally projecting, circumferentially spaced, longitudinally extending ribs on the work piece within the hole said hole having a first prescribed diameter;

b. placing a tubular member having an annular seamless tubular side wall having a generally circular crosssection with a maximum outside diameter a prescribed amount smaller than said first diameter and a head flange integral with one end of said side wall within said hole until said head flange engages said work piece, said side wall further defining a plurality of circumferentially spaced, longitudinally extending flutes therein, said flutes adapted to be slidably received on said ribs and engaged thereby to prevent rotation of said tubular member during step (c); and,

c. forcing a coining mandrel having external threads thereon corresponding to the threads on said fastener along the inside of said side wall while rotating said coining mandrel to form external and internal threads in said side wall and force said external threads into intimate engagement with said work piece about said hole while forcing the side wall into the work piece about the preformed hole so as to deform the work piece about the hole into the external shape of the coined threads in the side wall.

3,921,281

METHOD FOR JOINING STEEL BARS

Seiji Hattori, Nagoya, and Tomio Kimura, Tokyo, both of Japan, assignors to Daido Seiko Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 298,268, Oct. 17, 1972, abandoned. This application Sept. 17, 1974, Ser. No. 506,692

Claims priority, application Japan, Dec. 19, 1973, 48-142820; Oct. 28, 1971, 46-85723; Apr. 21, 1972, 47-40217; Apr. 17, 1972, 47-45223[U]; Aug. 14, 1972, 47-95198[U]

Int. Cl.² B21D *39/00;* B23P *11/00*

U.S. Cl. 29—520 3 Claims

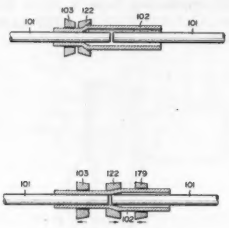
1. A method for joining two deformed steel bars comprising the steps of

placing the end portions of the two steel bars in a cylindrical sleeve,

gripping one end portion of said sleeve with a chuck device and simultaneously moving a die device whose inner diameter is smaller than the outer diameter of said sleeve, along the outer surface of the sleeve in the direction of its axis toward the other end of the sleeve so as to widen or

narrow the spacing between said die device and said chuck device whereby the sleeve is press-worked plastically along a part of its length and pressedly fitted on to said steel bars,

loosening said chuck device and simultaneously moving said chuck device along the outer surface of the sleeve in the direction of its axis toward the other end of the sleeve so



as to narrow or widen the spacing between said chuck device and said die device, and

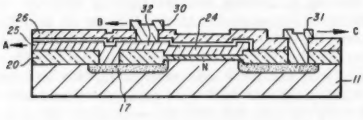
repeating alternately said gripping by the chuck device accompanied by said moving of the die device and said loosening of said chuck device accompanied by said moving thereof so that the sleeve is across its full length plastically worked to be pressedly fitted onto the two steel bars.

3,921,282

INSULATED GATE FIELD EFFECT TRANSISTOR CIRCUITS AND THEIR METHOD OF FABRICATION

James A. Cunningham; Robert H. Wakefield, Jr., and Mark R. Guidry, Jr., all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 16, 1971, Ser. No. 115,428
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **2 Claims**



1. A method of fabricating an insulated gate field effect device circuit comprising the steps of:

a. forming a silicon nitride mask pattern on the surface of a monocrystalline silicon body of one conductivity type;

b. exposing said masked body to a suitable impurity for converting the exposed portions of the silicon surface to the opposite conductivity type for source, drain and doped interconnect regions;

c. exposing the masked body to an oxidizing atmosphere whereby the silicon is selectively oxidized to form a thick oxide layer;

d. removing the mask;

e. again subjecting the body to oxidizing conditions to form a thin oxide film having the same pattern as said mask;

f. selectively forming openings in the thick oxide for source, drain and doped interconnect connections;

g. selectively depositing a layer of polycrystalline silicon on said body to form a gate electrode in combination with source, drain electrodes and/or doped interconnects, a silicon interconnect crossing over at least one of said diffused regions and being insulated therefrom by said thick oxide layer;

h. forming an insulating layer on said body;

i. selectively forming openings in the insulating layer for silicon interconnect connections; and

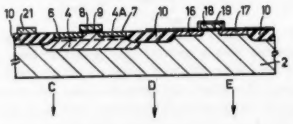
j. selectively forming a plurality of conductive interconnects on said body connecting at least one of said conductive interconnects to one of said silicon interconnects and at least one of said conductive interconnects crossing over one of said doped interconnects or said silicon interconnects and being insulated therefrom by said insulating layer.

3,921,283

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE DEVICE

Joseph Shappir, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 245,243, April 18, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,307
Claims priority, application Netherlands, June 8, 1971, 7107805
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **21 Claims**



1. A method of manufacturing a semiconductor device, comprising providing a layer masking against oxidation on a part of the surface of a first region of a first conductivity type of a semiconductor body, oxidizing the body surface part not masked by the oxidation mask until there is formed a layer-shaped oxide pattern which is at least partly inset in the semiconductor body and which substantially entirely surrounds a surface part of the first region, introducing from the outside into said surface part a doping material determining the second conductivity type to form a second region of the second conductivity type, the inset oxide pattern serving to mask the underlying body against said doping material, introducing from the outside into said second region via spaced surface parts thereof to a depth less than the thickness of said second region a doping material determining first conductivity type to form at least source and drain zones of a first insulated gate field effect transistor, the inset oxide pattern again serving to mask the underlying body parts against the said doping material and determining a substantial part of the outer boundary of the source and drain zones, providing at least one gate electrode layer which is separated from the second region by an electrically insulating layer and which extends above at least a part of the surface of the second region between the source and drain zones, and making connections to the source and drain zones and to the gate.

3,921,284

ARMATURE WINDING METHOD AND MACHINE

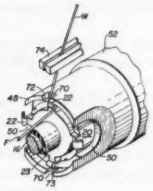
Glen E. Bucholtz, Tipp City, and Hyman B. Finegold, Dayton, both of Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Mar. 13, 1973, Ser. No. 340,653
Int. Cl.² H02K *15/09*; H01R *43/06*
U.S. Cl. 29—597 **6 Claims**

1. For use with a flier-type armature winder of the type having a commutator shield device including a notched inner shield and means for covering the inner shield and commutator tangs during the winding of coils of wire by a flier, a method for connecting a finish wire of an armature being wound to a selected commutator tang and for severing the finish wire comprising the steps of:

1. locating a notch in said inner shield in overlying relation to said commutator and angularly spaced from said selected tang,

2. at the termination of the winding of the last coil by said flier, exposing said selected tang,
3. rotating said flier in a direction opposite to its direction of rotation when winding coils, thereby to hook the wire leading from said flier over said selected tang,
4. bending the portion of said wire between said selected tang and said flier toward the armature core,



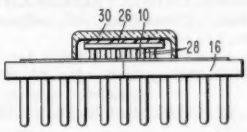
5. rotating said armature core and said commutator to position said selected tang adjacent said notch,
6. positioning said bent portion of wire in said notch,
7. relatively rotating the armature and said inner shield to cause said wire to be severed by an edge of said notch, and
8. prior to the severing of said wire clamping said wire between said selected tang and said flier.

3,921,285

METHOD FOR JOINING MICROMINIATURE COMPONENTS TO A CARRYING STRUCTURE

Bogdan Krall, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1974, Ser. No. 488,592
Int. Cl.² H05K *3/34*
U.S. Cl. 29—626 **15 Claims**



1. A method for elongating the solder terminals physically and electrically connecting a component to a carrying structure comprising:

positioning a component onto a carrying structure spaced therefrom by solder terminals;

placing an amount of vaporizable material upon the surface of said component opposite to the surface having said solder terminals;

placing a bridge over the components so that there is a cavity between the surface of said component having said material thereon and the bottom of the bridge;

said material becomes liquid with temperature rise at least before the said solder melts at which time it wets the said bridge and said surface;

heating the structure until said solder terminals are softened and until a desired portion of said material is evaporated which pulls by surface tension the said component closer to said bridge and which in turn elongates the said solder terminals; and

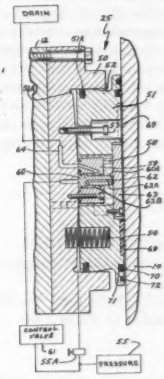
cooling the structure to room temperature.

3,921,286

PRESSURE BALANCED HYDROSTATIC SLIP BEARING USED IN A GUIDE AND RESTRAINT SYSTEM

Niel R. Petersen, Hopkins, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed May 16, 1974, Ser. No. 470,631
Int. Cl.² F16C *29/02*
U.S. Cl. 308—3 R **20 Claims**



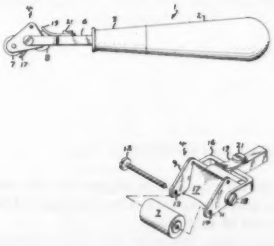
1. A pressure balanced hydrostatic slip bearing comprising means forming a movable wall chamber having a wall movable in a direction of expansion in response to fluid pressure in said chamber, means on the exterior of said movable wall forming a hydrostatic bearing for a member to be guided, a source of fluid under pressure, means including flow sensitive orifice means connecting said source of fluid under pressure to said chamber, drain orifice means leading from said chamber and being separate from the connection of said flow sensitive orifice means to said chamber, said drain orifice means including a portion responsive to movement of said movable wall whereby the size of said drain orifice means changes when said movable wall moves from a reference position established by flow of fluid under pressure to said chamber and through said drain orifice means.

3,921,287

FRUIT PEELER

Gerardo Gomez, 1113 Birch St., Boonton, N.J. 07005

Filed July 19, 1974, Ser. No. 489,923
Int. Cl.² B26B *3/00, 29/00*
U.S. Cl. 30—280 **3 Claims**



1. A fruit peeler device, for cutting off a portion of a fruit peel, comprising, in combination:

a handle for holding said device;

U-shaped support means including two elongated members and a cross member therebetween connected to said handle;

front and rear roller means each having an axis substantially parallel to the other and disposed spaced apart to define a substantially flat working surface for moving said device in contact with said fruit peel during the cutting thereof; cutting means disposed between said front and said rear roller means and operative for cutting off said portion of said fruit peel, said cutting means comprising a cutting edge portion projecting obliquely across said working surface and having at least a central part curved away from said front roller means; and

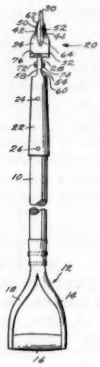
connection means operative to connect said front and said rear roller means and said cutting means together to form a unit rotatably connected to said elongated members for rotation about an axis substantially parallel to the axes of said roller means, whereby movement of said device with said front and said rear roller means contacting said fruit peel results in said cutting edge cutting off said portion of said fruit peel.

3,921,288

WRECKING TOOL

Richard W. Clemens, Jr., 9201 Wellington Court, Seabrook, Md. 20801

Filed Oct. 31, 1974, Ser. No. 519,564
Int. Cl.² B25B *3/00*
U.S. Cl. 30—299 **10 Claims**



1. A wrecking tool comprising:

a pole;

a head member attached to an end of said pole, said head member embodying means for holding said head member to said end of said pole;

a shank extending upwardly from said holding means and tapering to a pointed end;

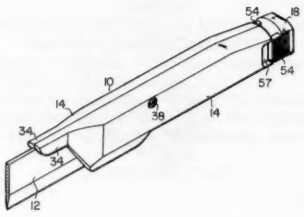
a blade projecting outwardly from said shank and at an acute angle with respect to the lower portion of said shank, said blade defining upper and lower surfaces; and upper and lower curved surfaces defining curved edges that extend from said blade in an upwardly curving manner to said shank.

3,921,289

BLADED CUTTING TOOL WITH REMOVABLE AND REPLACEABLE BLADE

Shigeki Hasegawa, Mino, Japan, assignor to Feather Kogyo K.K., Japan

Filed July 25, 1974, Ser. No. 491,853
Claims priority, application Japan, Mar. 4, 1974, 49-25741
Int. Cl.² B26B *1/00*
U.S. Cl. 30—338 **5 Claims**



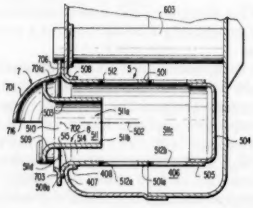
1. A handle for releasably holding a flat blade and comprising two essentially similar halves secured together at an essentially planar interface and conjointly defining a central longitudinal passageway and a blade-receiving slot forwardly of the passageway, a rod axially slidable in and along said passageway, said rod extending rearwardly to protrude slightly from the end of the handle, a nose fixed with the forward end of said rod and axially movable with the same from a first forward position engageable with a blade fitting said slot, to a second retracted position free of the blade, a knob fixed to said protruding end and operable to move said rod and nose between first and second positions, and lug means carried by said knob to engage said handle and hold said rod in second and retracted position when said rod, nose and knob are retracted and rotated as a unit through a predetermined angle.

3,921,290

CHAIN SAW WITH CYCLICALLY RESTRICTED AND CONTINUOUSLY VENTED ACOUSTIC FILTERING

Jay Richard Bailey, Chatsworth, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 220,632, Jan. 25, 1972, Pat. No. 3,798,769. This application Jan. 18, 1974, Ser. No. 434,654
Int. Cl.² B27B *17/00*; F01N *1/16*
U.S. Cl. 30—381 **8 Claims**



1. In a chain saw including an apparatus for reducing the noise generated by chain saw operation, and wherein said chain saw includes

chain saw cutting means including

guide bar means, and

cutter chain means supported on said guide bar means for traversal through a cutting path; and

chain saw power means including
chain saw engine means having a working chamber means, and
chain saw power transmitting means operable to transmit driving force to said cutter chain means and cause said cutter chain means to traverse said cutting path;
the improvement in said noise reducing apparatus comprising:
exhaust passage means communicating with said working chamber means of said chain saw engine means and operable to transmit a flow of cyclically pulsing exhaust gas therefrom;
generally tubular, outlet passage means operable to receive said flow of exhaust gas and transmit said flow to the atmosphere;
exhaust flow responsive, cyclically operable flow restricting means telescopingly mounted in said outlet passage means and operable in response to pressure pulsations in said flow of exhaust gas to cyclically restrict a portion of said flow of exhaust gas transmitted through said outlet passage means;
continuously operable venting means operable to permit a continuous flow of a portion of said flow of exhaust gas through said outlet passage means to the atmosphere concurrent with said cyclic restriction of a portion of said exhaust flow through said outlet passage means; and

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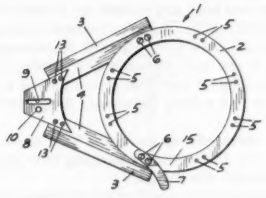
3,921,291
CHAIN SAW BOW

Louis L. Henley, 3617 Maywood Drive, Shreveport, La. 71109

Filed Mar. 28, 1975, Ser. No. 563,215
Int. Cl.[2] B27B *17/06*
U.S. Cl. 30—382 **10 Claims**



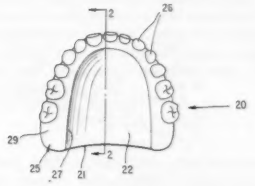
1. A chain saw bow comprising:
a. a frame having an essentially circular shape of predetermined diameter;
b. a plurality of apertures in spaced relationship in said frame;
c. a pair of chain guards, each having at least one aperture at each end thereof carried by said frame at one of said each end; and
d. an engine mount plate carried by the free ends of said chain guards and adapted to removably and adjustably cooperate with the engine housing of a chain saw.

3,921,292
METHOD OF BONDING CURED RUBBER AND ACRYLIC RESIN USEABLE IN MAKING A COMPOSITE DENTURE PROSTHESIS

Wasil Ivchenko, 9120 Brecksville Road, Brecksville, Ohio 44141

Filed Feb. 22, 1974, Ser. No. 444,950
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—2 **4 Claims**

1. A method of making a composite denture prosthesis, said method comprising:
a. obtaining an impression of the mouth structure of a user of said denture;
b. making a model of said mouth structure from said impression, said model including the alveolar ridge portion of said mouth structure;
c. covering said model with a sheet of curable rubber, conforming said rubber, by use of heat and pressure, to said model to form a base plate, and forming an inwardly extending lip on said base plate, said lip being positioned on the upper, interior alveolar ridge portion of said base plate;
d. partially embedding metal alloy particles in said alveolar ridge portion of said rubber base plate;
e. curing said base plate while said base plate is under pressure;
f. forming an acrylic resin tooth carrying member, said acrylic resin member conforming generally to the shape of the alveolar ridge portion of the mouth structure;

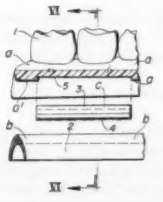


g. positioning false teeth in said acrylic member;
h. pressing said acrylic member to said alveolar ridge portion of said base plate to form a denture assembly wherein said acrylic member is formed so as to overlie said alveolar ridge portion of said base plate and to be coincident therewith whereby once said denture is in position in the mouth of the user, only said acrylic member is visible thereby providing an aesthetically pleasing prosthesis;
i. conforming said acrylic member to said lip to provide a smooth transition between said acrylic member and said base;
j. heating said assembly to cure said acrylic resin while subjecting said acrylic member and said base plate to pressure, whereby said metal particles partially embedded in said alveolar ridge portion of said base plate are also partially embedded into said acrylic member and act as a keying means, thereby providing a bond between said rubber base plate and said acrylic resin tooth carrying member.

3,921,293
DENTAL PROSTHESIS

Avedis Keumurdji, Tucuman St., N. 725, Buenos Aires, Argentina

Filed Aug. 19, 1974, Ser. No. 498,708
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—2 **10 Claims**



1. Dental prosthesis, comprising:
a. a base formed of rigid material carrying artificial teeth and having a cavity having the general conformation of the gum of the user,

b. a molding of concavo-convex cross-section formed of resilient material adapted to fit between the said cavity and the gum of the user, and

c. a mounting element fastened to the base and having an adhering surface engaging the molding, the mounting element consisting of a lamination of fabric layers, the layers contacting the molding having coarse fibres extending from it to lock into the surface of the molding.

3,921,294

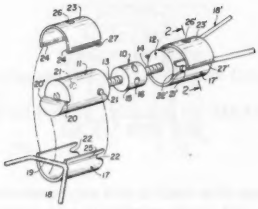
ORTHODONTIC BIASSING DEVICE

Melvin Wallshein, 8645 Bay Parkway, Brooklyn, N.Y. 11214

Filed Dec. 23, 1974, Ser. No. 535,688The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² A61C 7/00

U.S. Cl. 32—14 E **36 Claims**



1. An orthodontic biassing device comprising:

two spaced orthodontic expansion or contraction elements, each suitable for engaging one or more teeth;

an elongate biassing assembly extending between said elements and including a body housing means at each end portion thereof, said biassing assembly having an adjustably variable length; and

connecting means for non-rotatably and removably connecting each of said body housing means to a respective element such that each of said body housing means are selectively connectable and detachable from their respective element by relative movement therebetween, whereby biassing assemblies having different overall lengths can be interchanged.

3,921,295

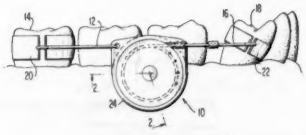
ORTHODONTIC DEVICE

John Oliver James, Lancaster, Pa., assignor to Hamilton Technology, Inc., Del.

Filed Aug. 26, 1974, Ser. No. 500,504

Int. Cl.² A61C 7/00

U.S. Cl. 32—14 E **11 Claims**



1. An orthodontic appliance comprising a housing, a pulley rotatably carried by said housing, a spring within said housing and secured at one end to said housing and at its opposite end to said pulley to bias said pulley for rotation in one direction, a pull cable wound about said pulley and adapted for extension from an initial position relative to said housing substantially tangentially thereof and against the bias of said spring and for connection with a tooth, means carried by said appliance for maintaining said spring under tension when said pull cable lies in said initial position whereby a tension force of at least a predetermined magnitude is maintained on said cable upon extension thereof from said housing, a guide carried by said housing for directing said cable from said housing substantially tangentially of said pulley, and means carried by said housing for securing the same to another tooth, said securing means being located along substantially the same tangent as said cable when said cable is extended from said housing and on the opposite side of said housing from the pull cable, the effective diameter of the pulley being of the same order as the width of a tooth.

3,921,296

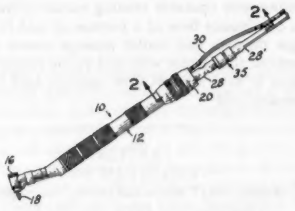
DENTAL DRILL SWIVEL

William H. Harris, 4513 S. Pennsylvania, Oklahoma City, Okla. 73119

Filed Jan. 2, 1974, Ser. No. 429,987

Int. Cl.² A61C 1/08

U.S. Cl. 32—27 **1 Claim**



1. In combination with a dental drill having a drill handle, a drill head secured to one end of the handle, a drill bit supported by the drill head and at least one conduit for conveying fluid to the drill handle, the improvement commprising:

a first swivel sleeve having a bore therethrough and connected, at one end, with said drill handle,

the other end of said first sleeve having a counterbore therein and having an annular flange intermediate its ends;

a second swivel sleeve having a bore therethrough and having one end portion extending into and frictionally engaging said one conduit,

the other end portion of said second sleeve forming a plug portion loosely received by the counterbore in said first sleeve,

said plug portion having a circumferential groove intermediate its ends, the depth of the groove being relatively shallow when compared with the diameter of the plug portion;

a coupling closely surrounding the counterbored end of said first sleeve,

one end of said coupling abutting the annular shoulder on said first sleeve,

said coupling having an inwardly projecting flange at its other end disposed in spaced relation with respect to the counterbored end of said first sleeve and defining an opening diametrically substantially equal with respect to the diameter of the counterbore;

an O-ring having the major portion of its cross sectional area interposed and compressed between the counterbored end of said first sleeve and the inwardly projecting flange of said coupling,

the inner peripheral surface of said O-ring sealing with the smallest peripheral surface of the groove of said plug portion,

the surface of the plug portion forming the side walls of the groove being arcuately curved longitudinally of the plug portion for ease in entering and release from said O-ring when the plug portion is inserted into and removed from the counterbore,

said plug portion having a tapered end surface converging toward its longitudinal axis at its end disposed within the counterbore,

said O-ring forming the sole connecting contact between said first and second sleeves and constituting a swivel connection permitting relative angular rotation and axial separation and joining of said first and second sleeves,

said second swivel sleeve having a cylinder-like annular flange intermediate its ends diametrically substantially equal with the diameter of said coupling and having its end surface facing said coupling normally disposed in spaced relation with respect to the adjacent end surface of said coupling for permitting axial tilting movement of said second swivel sleeve with respect to the axis of said first swivel sleeve without separation of the plug portion from within said O-ring; and,

swivel locking means comprising a U-shaped member having arcuate legs, and pivotally connected by one of its end portions with one said swivel sleeve,

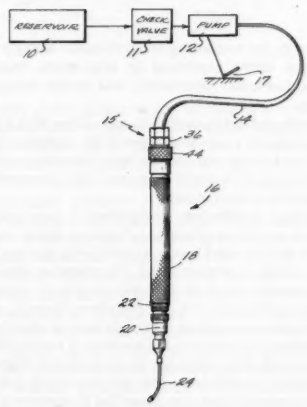
said member having another end portion adapted for frictionally engaging the other said swivel sleeve.

3,921,297

CHEMICALLY ACTIVE DECAY ATTACKING LIQUID ADMINISTERING APPARATUS AND FATIGUE RELIEVING CONNECTION THEREFOR

Jaroslav Vit, 40 Partridge Run, Belle Mead, N.J. 08502

Filed Oct. 15, 1974, Ser. No. 515,091
Int. Cl.² A61C *3/00*; F16L *27/08*
U.S. Cl. 32—40 R **9 Claims**



1. Apparatus for administering chemically active decay attacking liquid to dental caries comprising

a. a fluid delivery member adapted to be connected to a source of chemically active decay attacking liquid,

b. an applicator,

c. an elongated tubular handle connected at one end with said applicator, said handle having exterior surface means for manual engagement by an operator to facilitate maneuverability of said applicator, and interior passage means for delivering fluid from said fluid delivery member to said applicator, and

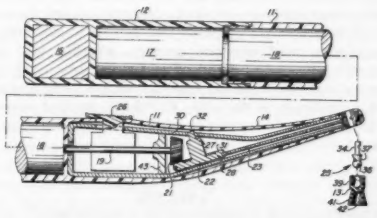
d. means for coupling said tubular handle at an opposite end thereof with said fluid delivery member and for allowing rotary movement of said handle relative to said fluid delivery member without the transmittal of fatiguing torque thereto, said coupling means including (1) a first tubular connecting member connected to said fluid delivery member and having a first shoulder portion disposed substantially perpendicular to the axis of said first tubular connecting member, (2) a second tubular connecting member connected to said tubular handle and having a second shoulder portion disposed substantially parallel to said first shoulder portion, (3) an elongated tubular portion extending from the shoulder portion of said first tubular connecting member, said second connecting member having an opening extending from the shoulder thereof therethrough and receiving said elongated tubular portion for rotation therein in a fixed position wherein a part of said elongated tubular portion extends completely through the opening in said second member, (4) means engaging said part of said elongated tubular portion for retaining said elongated portion in said position without hindering relative rotational movement between said connecting members, and (5) an anti-friction and sealing member encircling said elongated tubular portion and disposed between said shoulder portions and operatively engaging both of said shoulder portions when said elongated portion is in said position, said member comprising a ring of anti-friction material, said ring being the only accessory sealing and anti-friction means disposed between said first connecting member and said second connecting member.

3,921,298

DENTAL AND SURGICAL APPLIANCE

John B. Fattaleh, 4845 E. Indian School Road, Phoenix, Ariz. 85018

Filed Mar. 26, 1974, Ser. No. 454,812
Int. Cl.² A61C *3/06*
U.S. Cl. 32—59 **10 Claims**



1. A medical-dental tool comprising:

an elongated hollow housing tapering from a hand gripping, cylindrically shaped first end to a blunt, narrow implement supporting end having a rectangular or square cross-sectional configuration, said housing having an arcuate configuration between its ends,

said housing comprising a first portion adjacent its first end, power means mounted within said first portion to provide a balanced handle for said tool having an optimum weight distribution,

said power means comprising a direct current motor and a battery for energization thereof,

a switch mounted on the outer periphery of said first section to control said motor,

a drive pulley mounted in said housing at the implement supporting end,

a gear reduction drive mounted within said housing for connecting said motor to said drive pulley,

an implement mounting means provided adjacent said implement supporting end on the concave surface of said arcuate configuration within the outline of said housing for engaging and being driven by said drive pulley, and

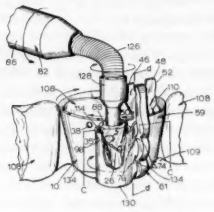
a drive belt within said housing for connecting said drive pulley to said power means,

said drive belt being driven in a straight line through said arcuate configuration of said housing.

3,921,299
RETAINERLESS DENTAL MATRIX AND METHOD OF MANUFACTURE

Harry J. Lazarus, 36 Knox Lane, Englishtown, N.J. 07726

Filed July 26, 1973, Ser. No. 382,833
Int. Cl.² A61C 5/12
U.S. Cl. 32—63 10 Claims

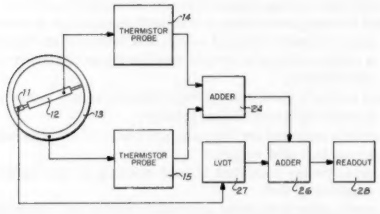


1. A dental matrix comprising in combination, a strip of thin flexible material having one end portion curved into a loop with an intermediate portion of said strip and overlying the same to form a matrix band, and retaining means to hold said strip in said looped configuration for application around a tooth; said retaining means permitting said intermediate portion of said strip to slide relative to said one end for tightening said band around said tooth, the other end portion of said strip having the edge which is positioned nearest the gingival of a patient being tapered outwardly toward the terminal end for a predetermined distance and the opposite edge of said other end portion also being tapered outwardly toward the terminal end thereof, and said tapered end portion of said strip being precoiled a predetermined amount, whereby said tapered opposite edges of said end of said strip respectively form a concavity to facilitate the insertion of a coiling tool therein and a concavity in the end of said coil applied nearest the gingival tissue of a patient to minimize possible trauma to the patient.

3,921,300
TEMPERATURE COMPENSATED MEASURING GAUGE

Joe T. Cox, and Thomas E. Prince, both of Louisville, Ky., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1974, Ser. No. 497,963
Int. Cl.² G01B 7/12
U.S. Cl. 33—125 T 2 Claims



1. A temperature compensated gauging device comprising, gauging means engageable with a workpiece for providing a first voltage output proportional to a dimension being measured,

a first thermistor for measuring the temperature of said workpiece and providing a second voltage output proportional to the temperature of said workpiece,

a second thermistor for measuring the temperature of said gauging means and providing a third voltage output proportional to the temperature of said gauging means,

a first amplifier for combining said second and third voltage outputs and providing a temperature compensating voltage output,

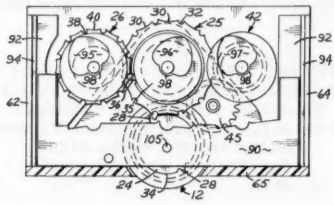
a second amplifier for combining said first voltage output and said temperature compensating voltage output to provide a temperature compensated output voltage proportional to a dimension of said workpiece, and

a readout device for indicating the magnitude of said temperature compensated output voltage.

3,921,301
MEASURING DEVICE

Dixon W. Tuley, 212 E. H St., Ontario, Calif. 91761

Filed June 12, 1974, Ser. No. 478,784
Int. Cl.² G01B 3/12
U.S. Cl. 33—141 R 7 Claims



1. A device for measuring linear distance along a surface in dimensional terms expressed in high-order, intermediate-order, and low-order increments, said device comprising:

a casing;

a traversing wheel journaled in said casing with a portion of its periphery projecting beyond the casing so that it can be rolled along said surface, said traversing wheel having a circumference equal to *n* times the intermediate-order dimensional increment;

a counting mechanism comprising a low-order indicia wheel, an intermediate-order indicia wheel, and a high-order indicia wheel, said wheels being arranged side-by-side within a common plane and rotatable with respect to one another, each of said indicia wheels having dimensional graduations on the periphery thereof, said intermediate-order indicia wheel having graduations corresponding in numder to the number of intermediate-order increments that there are in each of said high-order dimensional increments, and said low-order indicia wheel having graduations corresponding in number to the number of low-order increments that there are in each of said intermediate-order dimensional increments;

said low-order indicia wheel and said high-order indicia wheel being journaled for rotation on fixed axes, and said intermediate-order indicia wheel being journaled for rotation about an axis that is movable laterally with respect to said fixed axes;

first means for driving said low-order indicia wheel continuously from said traversing wheel at a rate such that for each revolution of the traversing wheel, said low-order indicia wheel is turned *n* revolutions;

second means for driving said intermediate-order indicia wheel intermittently by said traversing wheel in equal angular increments corresponding in number to the number of dimensional increments on the periphery thereof, said intermediate-order indicia wheel being advanced *n* increments with each revolution of the traversing wheel, and said second means being operable to immobilize said interemdiate-order indicia wheel except while it is being advanced;

third means for driving said high-order indicia wheel intermittently by said intermediate-order indicia wheel in equal angular increments corresponding in number to the number of dimensional increments on the periphery of the high-order indicia wheel, said high-order indicia wheel being advanced one increment with each revolution of said intermediate-order indicia wheel, and said third means being operable to immobilize said high-order indicia wheel except while it is being advanced; and

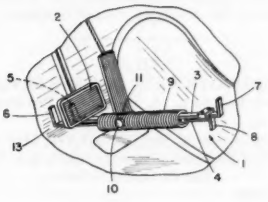
manually actuated resetting means operable first to shift said intermediate-order indicia wheel on said movable axis so as to disengage said first and second driving means, and then to engage and turn said indicia wheels so that they are all reset to zero.

3,921,302

BRAKE PEDAL CALIPER

Edward D. Wilkerson, P.O. Box 755 South Court, Normandy Beach, N.J. 08739

Filed June 26, 1974, Ser. No. 483,220
Int. Cl.² G01B 5/00
U.S. Cl. 33—169 R **6 Claims**



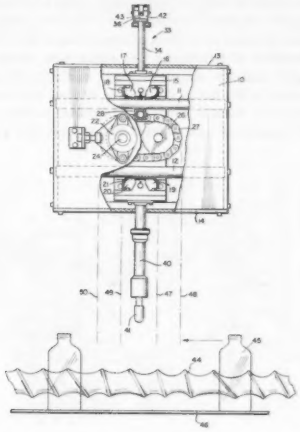
1. A brake pedal gauge which compares a brake pedal reserve distance after brake actuation to the total distance of an unactuated brake pedal from a vehicle floorboard, comprising a pair of at least partially overlapping elongated members which are relatively movable to vary the length of overlap, an elongated resilient element uniformly extensible throughout its range of elongation, subdividing means coupled to the resilient element for subdividing the resilient element into two parts, said subdividing means providing an observing window between said two parts, a first end of the resilient member being fixed to one of the longated members which member is adapted to be supported on a vehicle floorboard, and the opposite end of the resilient element being movably coupled to the one member, an indicator element fixed to one surface of the second member and being in a predetermined position of relative alignment with the subdividing means when the two members are in a position of maximum overlap, the elongated resilient element being so positioned with respect to the one surface of the second member that only a portion of the surface of the second member is viewable through the observing window, means fixed to the second elongated member which means is also coupled to the opposite end of the resilient element so as to the cause elongation only of the resilient element upon reduction of said overlap by relative movement of the two elongated members, means coupled to the second member adapted to engage the brake pedal and movable with the brake pedal, when the one of the elongated members is supported on the vehicle floor and the means coupled to the second member is engaging the brake pedal a corresponding elongation of the resilient element will occur, upon actuation of said brake pedal, the means coupled to the second member will cause relative movement of the elongated members, whereby the indicator mounted on said one surface of the second member may or may not be viewed at the observing window of the subdividing means depending upon whether the brake pedal reserve distance is inadequate or adequate respectively.

3,921,303

PLUG GAUGE

Anthony T. Zappia, Indianapolis, Ind., assignor to Ball Brothers Service Corporation, Muncie, Ind.

Filed July 2, 1973, Ser. No. 375,652
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² G01B 3/46, 5/00
U.S. Cl. 33—178 R **4 Claims**



1. A plug gauge for testing ware comprising linear guide means, a carriage mounted to reciprocate on said guide means, a plunger supported on said carriage for reciprocation transversely of the travel path of said carriage, an endless strand mounted adjacent said carriage to travel in a closed path lying in a plane parallel to the path of reciprocation of said plunger and said travel path of said carriage, means fixed to said strand means to travel about said closed path therewith and having an operative connection with said plunger for simultaneously reciprocably driving said plunger and said carriage, means to drive said strand, and means for conveying said ware along a path, a portion of which is parallel to said travel path and located directly below said plunger, said portion of said conveying means including means synchronizing the speed of travel of said ware along said portion to the speed of movement of said carriage.

3,921,304

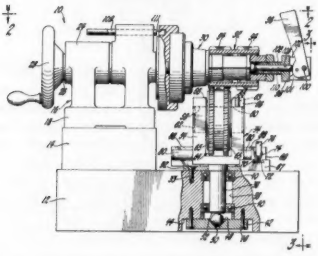
GEAR INSPECTION TOOL

Frank D. Yagiela, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 22, 1973, Ser. No. 325,261
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² G01B 5/24, 13/18
U.S. Cl. 33—179.5 C **2 Claims**

1. A tool for inspecting lead angles at each end portion of each tooth of a helical gear, said tool comprising a base member, a rotary control spindle mounted on said base member, an expanding mandrel mounted on said spindle, a fixed sleeve member, piston means slidably mounted in said sleeve member and operatively connected to said expanding mandrel, a lever pivotally mounted on an end portion of said sleeve member, a cam surface formed on said lever in contact with an end face of said piston means for causing said piston means to expand said mandrel in response to pivotal movement of said lever once said helical gear has been manually placed around said mandrel to grippingly engage said helical gear, a vertical opening formed in said base member, a plate secured to said base member adjacent the bottom edge of said opening, a ball

member rotatably mounted on said plate, a bracket member having spaced parallel side walls interconnected by a bottom wall, with the vertical center thereof being located beneath the axial midpoint between said end portions of the teeth of said helical gear, a stem member extending downwardly from said vertical center of said bottom wall of said bracket member through said vertical opening and mounted on said ball member for rotatably supporting said bracket member thereon, bearing means mounted in said vertical opening for vertically aligning and rotatably supporting said stem member, a master gear rotatably mounted on a shaft supported between said spaced parallel side walls of said bracket member, friction discs mounted intermediate the outer side surfaces of said master gear and the adjacent inner surfaces of said spaced parallel side walls for providing a sliding resistance to the rotation of said master gear, an abutment surface formed on an outer surface of one of said spaced parallel side walls of



said bracket member, the plane of said abutment surface being such that it extends through the axis of said stem member, two spaced rows of teeth formed around the outer periphery of said master gear and suitable for contacting one side of said respective end portions of said helical gear teeth, an air gage, a follower member abutting against said abutment surface of said bracket member, and pressure signal-actuating means operatively connected between said follower member and said air gage for causing said air gage to indicate the amount of pivot of said bracket member about said axis of said stem member as said master gear is caused to rotate during one complete revolution of said helical gear by manual rotation of said spindle, the amount of pivot corresponding to the variation in lead angles of said one side of said end portions of each and all teeth of said helical gear, with the variation in lead angles of the other side of said end portions of each and all teeth being indicated by reversing the rotation of said spindle.

3,921,305
METHOD AND APPARATUS FOR DIGITALLY OPERATING A COMPASS CARD IN A NAVIGATION SYSTEM

Edward J. King, Jr., and Clarence Van Englehoven, both of Olathe, Kans., assignors to King Radio Corporation, Olathe, Kans.

Filed Jan. 8, 1973, Ser. No. 321,750
Int. Cl. G01c 17/38
U.S. Cl. 33—317 D **9 Claims**

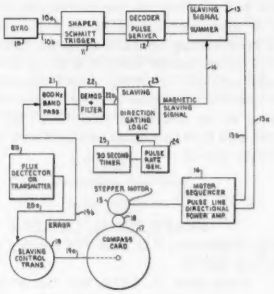
1. A pictorial navigation system having a compass card therein, said system comprising,

a gyro,

means for obtaining digital information from said gyro indicative of aircraft heading changes,

a motor, said motor interconnected with said compass card and operable to rotate said compass card in either a clockwise or counterclockwise direction,

means for decoding said digital information and for using said decoded digital information to effect the operation of said motor and the rotation of said compass card, said decoding and using means including means for magnetically producing digital information indicative of said aircraft heading, and

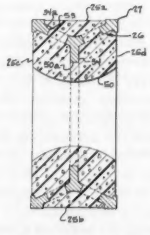


means for digitally slaving said compass card with said magnetically produced information to thereby magnetically correct the displayed aircraft heading.

3,921,306
CARPENTER'S AND MASON'S LEVEL

Mike A. Provi, Rockford, Ill., assignor to Pro Products, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 363,978, May 25, 1973, abandoned. This application May 31, 1974, Ser. No. 474,935
Int. Cl.² G01C 9/28
U.S. Cl. 33—379 **14 Claims**



1. In a level having an elongated level body of generally rectangular cross section with a pair of relatively parallel edge faces and a pair of relatively parallel side faces and at least one level vial mounted on the level body in predetermined relationship to the edge faces of the level body, the improvement wherein the level body comprises an elongated metal frame having four relatively parallel rails arranged in a transversely rectangular array and internal metal web structure interconnecting the four rails and spaced inwardly of the rectangular array to define a longitudinal channel at each of the four sides of the array, the rails each having a pair of outer faces at right angles to each other and arranged to form the four lengthwise extending corners of the level body and said rails each having a width measured along each of said pair of outer faces thereof in a line perpendicular to their length which is greater than the thickness of the respective flanges to provide a transversely enlarged portion along the outer edges of each flange, the web structure having openings therein interconnecting the channels, a unitary body of rigid foamed plastic having sections thereof substantially filling the channels at each of the four sides of the array with adjacent body sections interconnected through said openings in the web structure of the frame, the outer faces of the body sections in each channel being offset inwardly from the outer faces of the respective rails such that

the outer faces of the rails form the work contacting surfaces of the level body.

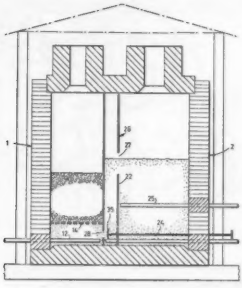
9. A level according to claim **1** wherein said internal web portion includes a central web generally paralleling one pair of opposed sides of the array and four longitudinal flanges extending laterally from the central web to the respective corner rail.

3,921,307

FLUIDIZED BED APPARATUS AND METHODS

Jiri Frantisek Marek, Kotara; Bruce Ronald Evans, North Lambton, and Thomas George Callcott, Mayfield, all of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Dec. 29, 1972, Ser. No. 317,765
Int. Cl.² F26B *3/08*; F27B *15/00*
U.S. Cl. 34—10 **18 Claims**



1. A fluidised bed apparatus comprising a generally horizontal treatment channel adapted to contain a bed of particulate carrier means at one end of the treatment channel for feeding compacts into the bed of carrier, means for fluidising the bed of carrier in such a manner as will result in the transport of carrier and compacts to the other end of the treatment channel, a plurality of transfer means of two types disposed along the treatment channel one type being for the removal of carrier from the channel and the other type being for the return of carrier to the treatment channel, a device for changing the temperature of the carrier removed from the treatment channel prior to its return to the treatment channel, said transfer means of said one type including a passage connected to the temperature changing device and having an outlet opening into the treatment channel at or near the base or floor thereof while the transfer means of said other type includes a passage having its inlet opening to the channel just below the top of the bed, whereby the carrier from the temperature changing device passes upwardly through the channel in a direction which is transverse to the direction of transport of the compacts and carrier, and means at said other end of the treatment channel for discharging compacts and/or carrier from the treatment channel.

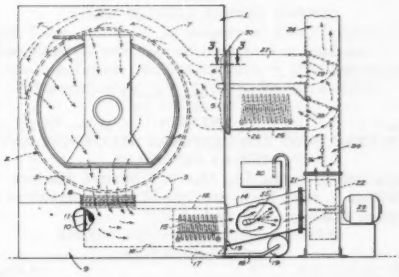
12. A method for physically reacting a carrier material, compacts, and a fluid or fluids comprising feeding the compacts into one end of a bed of carrier material, fluidizing the bed continuously or intermittently by at least one of the fluids and maintaining the bed at a predetermined temperature or temperatures varying along the length of the bed, removing carrier from the bed at a plurality of positions along the length of the bed at a location just below the top of the bed, changing the temperature of the removed carrier, returning the removed carrier to the bed at a plurality of positions along the length of the bed at a location at or near the bottom of the bed so that the returned carrier passes upwardly through the bed in a direction transverse to the direction of transport of the carrier and compacts in the bed, and discharging the compacts from the other end of the bed.

3,921,308

METHODS FOR TREATING YARN BUNDLES

Benjamin H. Freze, Anaheim, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.

Filed Nov. 23, 1973, Ser. No. 418,253
Int. Cl.² F26B *3/06*
U.S. Cl. 34—13 **8 Claims**



8. A method of treating yarn bundles, characterized by:

a. subjecting the yarn bundles to tumbling while circulating air at ambient temperature therethrough to effect relaxation of the fibers;

b. tumbling a load of yarn bundles while heating and introducing steam into the yarn bundles until the yarn bundles reach a temperature wherein the yarn fibers acquire a false body;

c. continuing the tumbling of the yarn bundles while the yarn bundles are further heated and steamed until the yarn fibers are heat-set;

d. and continuing the tumbling of the yarn bundles while cooling and extracting a predetermined proportion of water from the yarn bundles.

3,921,309

METHOD OF DRYING LUMBER

Kenji Nakayashiki, Oita, Japan, assignor to Seiwa Kosan, Ltd., Osaka, Japan

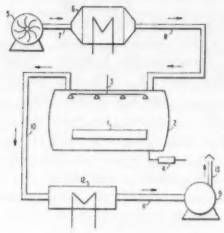
Filed Aug. 26, 1974, Ser. No. 500,767
Claims priority, application Japan, Aug. 24, 1973, 48-95365
Int. Cl.² F26B *7/00*
U.S. Cl. 34—13.8 **7 Claims**

1. A method of drying lumber, comprising the steps of:

1. blowing steam through a hermetically sealable chamber in which the lumber to be dried is placed;

2. blowing hot air at a temperature of between about 60° to about 90°C through said chamber;

3. evacuating said chamber;
4. repeating steps (2) and (3) alternately at least once; and

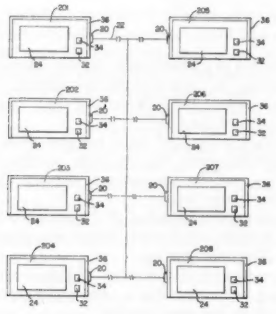


5. repeating at least once the sequence of steps (1), (2), (3) and (4).

3,921,310
INTERCONNECTED RESPONSE RECORDING AND DISPLAY CONSOLES

Ralph Smeda, Reston, Va.; Marvin I. Mindell, Pittsford, and William T. Daly, Rochester, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,244
Int. Cl.² G09B 5/00
U.S. Cl. 35—8 R **21 Claims**



1. An apparatus for the selective transmitting and receiving of responses between a plurality of console operators comprising:

a plurality of response recording and response displayconsoles;

electrical interconnection means operably coupling the consoles;

each of the consoles including a plurality of electrical switches each having a plurality of stable states including a response recording state and a non-response recording state;

each of the consoles including a plurality of response indicating lamps;

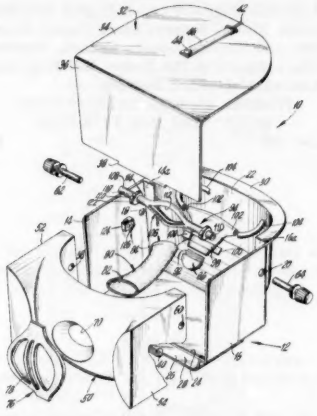
each lamp operably associated through electrical circuitry with a corresponding one of the switches on the same console and also operably associated through the interconnection means with a corresponding one of the lamps on each of the other consoles;

each of the consoles including a console operator actuable display selection switch adapted to interrupt the electrical association between the lamps on the same console and the corresponding lamps on each of the other consoles.

3,921,311
CLINICAL DEMONSTRATION MODEL

W. B. Rogers Beasley, Brooklyn, N.Y.; Jean Morehead, Needham Heights, Mass.; Elaine Pendleton, Brooklyn, and George Schmidt, Douglaston, both of N.Y., assignors to The Pathfinder Fund, Boston, Mass.

Filed Jan. 6, 1975, Ser. No. 538,766
Int. Cl.² G09B 23/30
U.S. Cl. 35—17 **15 Claims**



1. A clinical demonstration model of the human female pelvic region, said model comprising:

a. a housing;

b. a replica of a pelvis mounted in said housing;

c. a transparent replica of a uterus mounted in said housing in opposition to said pelvis replica;

d. a replaceable replica of a cervix mounted on said uterus replica;

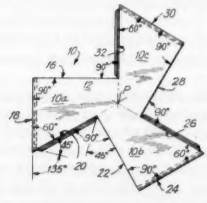
e. a resilient, transparent replica of a vagina replaceably positioned between and coupling said cervix to said pelvis replica; and

f. means for adjustably mounting said uterus replica within said housing and for selectively rotating said uterus replica about a transverse first axis to an anterior, a mid, or a posterior position.

3,921,312
EDUCATIONAL CONSTRUCTION

Craig Fuller, 11380 Poblado Road, San Diego, Calif. 92127

Filed Nov. 26, 1974, Ser. No. 527,204
Int. Cl.³ A63H 33/06
U.S. Cl. 35—27 **8 Claims**



1. In an educational construction having a plurality of identically-shaped construction pieces adapted to be interconnected to each other to form a variety of construction configurations, the construction piece comprising: three substantially identical legs extending from the center of the construction piece and being disposed symmetrically therearound, each leg

having first, second and third sides with said second and third sides substantially equal in length, the second side of each leg being disposed away from the center of the construction piece and connecting the first and third sides of the leg, the first side of the leg and the third side of an adjacent leg intersecting to form a first exterior angle substantially equal to 90°, the first side and the second side of the leg intersecting to form a second interior angle substantially equal to 90° and substantially equal to said first exterior angle, and the second side and the third side of the leg intersecting to form a third interior angle substantially equal to 60°.

3,921,313

INJECTION MOLDED BOOTS

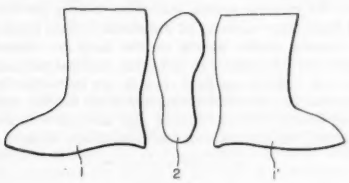
Buhei Mahide, Ashikaga, and Atushi Onai, Ohta, both of Japan, assignors to Kohkoku Chemical Industry Co., Ltd., Tokyo, Japan

Filed July 30, 1973, Ser. No. 384,099

Claims priority, application Japan, Nov. 27, 1972, 47-118720; Dec. 27, 1972, 48-1484; Jan. 19, 1973, 48-8324; Jan. 19, 1973, 48-8919

Int. Cl.² A43B *1/10*

U.S. Cl. 36—4 **5 Claims**



1. A boot which comprises:

A. a boot sock having a toe portion, a shank portion and a curved instep portion leading from the toe portion to the shank portion and a bottom sole portion, said sock being composed of a synthetic leather laminate prepared by coating a stretchable textile fabric inner layer with a synthetic resin outer layer, said outer layer having a decorative pattern printed thereon, the boot sock being constructed from one or more sewn together pieces of said laminate wherein the sewn portions appear only in the back of the shank portion or the sole portion wherein the sewn portions are sewn together with transparent sewing thread; and

B. an insole bottom adjacent said sole portion; and

C. a transparent resin layer injection molded over the boot sock and insole combination.

3,921,314

RESILIENT LINK MEANS FOR THE APRON OF A SELF-LOADING SCRAPER

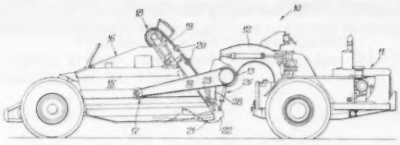
Gary P. Freese, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 24, 1975, Ser. No. 552,382

Int. Cl.² E02F *5/00*

U.S. Cl. 37—8 **10 Claims**

1. In a scraper of the type comprising a tractor having a transversely disposed draft tube secured rearwardly thereon, a scraper bowl having an open forward end and a cutting edge secured forwardly thereon, a pair of draft arms pivotally interconnected between said draft tube and said scraper bowl, actuating means interconnected between said draft tube and said scraper bowl for selectively raising or lowering said scraper bowl and an apron pivotally mounted on a forward end of said bowl for movement between closed and opened positions on said bowl, the improvement comprising resilient link means operatively interconnected between said draft tube and said apron for automatically pivoting said apron between its opened and closed positions upon actuation of said actuating means and for maintaining a predetermined closing force on said apron when it is in its closed position on said bowl.



3,921,315

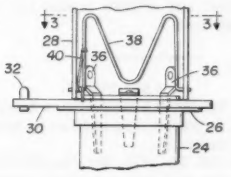
SNOW BLOWER SAFETY CHUTE

Floyd Tome, Clifton, N.J., assignor to Eska Company, Dubuque, Iowa

Continuation of Ser. No. 377,554, July 9, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,553

Int. Cl.² E01H *5/00*

U.S. Cl. 37—43 R **5 Claims**



1. For use in an apparatus for removing snow, said apparatus including a supporting structure, removal means for picking up the snow from the ground, and an improved chute providing a discharge passageway for directing the snow from the removal means away from the apparatus, said improved chute comprising a first portion having a wall defining a discharge passageway communicating with said removal means, a second portion of said chute movably affixed to said first portion and having a wall providing a continuation of said discharge passageway, said second portion having an inlet opening and a discharge opening and being turnable with respect to said first portion to direct the snow from said passageway in a selected direction out of said discharge opening, and means for loosening snow which has accumulated in the passageway of said first portion, said last mentioned means consisting of at least one prong fixed to said second portion around the inlet opening thereof and extending into the discharge passageway of said first portion close to the inner surface of the wall defining said passageway.

3,921,316

EARTH MOVING MACHINE BUCKET WITH PIVOTABLE SIDES

Rene V. Moreau, Ermenonville, France, assignor to Societe Anonyme: Poclain, Belleville, France

Filed July 5, 1974, Ser. No. 485,967

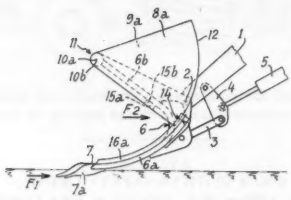
Claims priority, application France, July 17, 1973, 73.26186

Int. Cl.² E02F *3/81*

U.S. Cl. 37—118 A **5 Claims**

5. A bucket for use on an earth moving machine comprising at least one concave blade, a transverse extremity of which constitutes an attacking or leading edge of the bucket, two sides laterally bordering said blade and forming therewith an inner cavity of the bucket, said sides being pivotally mounted with respect to said blade for pivotal movement around an axis

substantially parallel to said leading edge and located on said blade adjacent the transverse extremity of said blade opposite to said leading edge, and return means acting between said blade and said sides and urging said sides toward the positions thereof with respect to said blade which provide a maximum



volume for said interior cavity of said bucket, said return means comprising a pair of torsion bars forming pivot means for said sides, one end of each of said bars being rigidly connected respectively to one of said sides and the other of said sides and the other end of each of said bars being rigidly connected to said blade.

3,921,317

APPARATUS TO IRON FIBERS ON A MOVING WEB

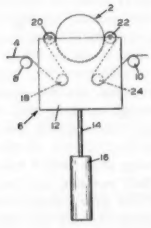
Michael J. Kolb, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 26, 1973, Ser. No. 409,816

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² DO6F 61/08

U.S. Cl. 38—49 **4 Claims**



1. An apparatus for processing a moving web comprising a drum having a surface conditioned to process one surface of the moving web, inlet guide means guiding the moving web towards the drum and outlet guide means guiding the moving web away from the drum, and a guide means positioned adjacent the drum to guide the moving web around a portion of the peripheral surface of the drum, a carriage structure, said guide means being mounted on said carriage structure whereby the moving web can be held in an operative position in contact with the periphery of the drum and in another inoperative position out of contact with the periphery of the drum, and said guide means being so constructed and arranged that it will automatically take up any slack in the moving web as the moving web is moved from a curved path in contact with the drum to a straight-line path out of contact, but adjacent to the drum.

3,921,318

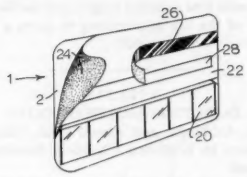
BODY-CARRIED MEDICAL HISTORY CARD

Anthony Calavetta, 1554 Wilhemina Rise, Honolulu, Hawaii 96817

Filed Jan. 22, 1973, Ser. No. 325,943

Int. Cl.² G09F 3/02

U.S. Cl. 40—2.2 **9 Claims**



1. A medical history identification card comprising a body-carried generally rectangular unitary integrally formed card having a human visually readable visible indicia bearing first portion, visible indicia photographically disposed in the first portion, and having a medical record microfilm bearing integrally formed second integral portion and medical microfilm records photographically disposed in the second portion, wherein the medical record microfilm bearing portion is recessed from outer surfaces of the visible indicia bearing portion, whereby visible indicia on the card are immediately accessible for information to its bearer, medical personnel and others, and wherein medical records are immediately available to medical personnel having microfilm readers and printers, and whereby bearer indicia and microfilm records are concurrently affixed for avoiding erroneously entered data.

3,921,319

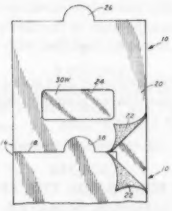
POCKET-FORMING MEMBER WITH WINDOW THEREIN

James D. Styers, 5132 W. Geddes Circle, Littleton, Colo. 80123, and Paul H. Styers, 3984 S. Pinehurst Circle, Denver, Colo. 80235

Filed Sept. 11, 1972, Ser. No. 287,991

Int. Cl.² G09F 3/18

U.S. Cl. 40—10 R **3 Claims**



1. The label-like member which comprises: an opaque sheet having a centrally located opening therein; a coating of non-drying adhesive on the back of the opaque sheet; and a transparent sheet of glassine material cut into three separate sections each of which is attached for independent removal to the adhesive coating as a protective cover therefor, said cover having a first window forming section covering the centrally located opening in the opaque sheet so as to leave a border area with the adhesive exposed across the bottom and along sides of said sheet as well as an uncovered flap area across the top, a second border covering section detachably affixed to said exposed border area, and a third flap covering section detachably affixed to said uncovered flap area, said first and third sections cooperating with one another and with the adhesive on the border area upon removal of the second

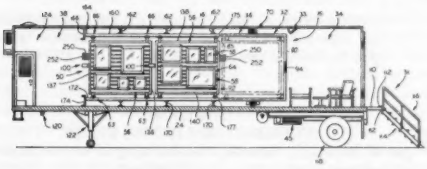
section therefrom to define an upwardly opening pocket when glued to a supporting surface, and said flap area providing means for closing the entrance to said pocket upon removal of the third section therefrom.

3,921,320

MOBILE STORAGE AND DISPLAY ARRANGEMENT FOR PICTORIAL ART

Joseph E. McWilliams, 1345 Canterbury Lane, Glenview, Ill. 60025

Filed Nov. 15, 1973, Ser. No. 415,995
Int. Cl.² G09F 11/30
U.S. Cl. 40—32 6 Claims



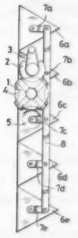
1. In a vehicle for storing and displaying pictorial art for itinerant vending of same, with the vehicle including an enclosed wheeled body defining a viewing area therein adjacent the rear end of same for accommodating persons wishing to view the pictorial art stored in the vehicle forwardly of the viewing area, and a means of access thereto adjacent the vehicle rear end, the improvement comprising:
- a plurality of parallel storage ways extending longitudinally of the vehicle and located forwardly of and spaced from said viewing area,
- said storage ways being formed to define rearward ends that are aligned transversely of the vehicle,
- a panel mounted on each of at least some of said ways for movement longitudinally thereof,
- said panels being vertically disposed and including means for removably mounting pictorial art selections on either side of same,
- a display way interposed between said storage ways and said viewing area and extending transversely of the vehicle,
- and an open centered planar panel display frame mounted for movement longitudinally of said display way and for swinging movement about a vertical axis that floats with said frame longitudinally of said display way,
- said display frame being formed to define a display frame way at the level of said storage ways that extends across said frame and is proportioned to receive one of said panels for movement therealong to dispose same at the frame open center for display purposes,
- said display frame being proportioned to have one end of same disposed adjacent the rearward ends of the respective storage ways when said frame is disposed in coplanar relation thereto,
- said frame one end and said frame way being formed for transfer between said frame way and a selected one of said storage ways, when said frame is in said coplanar relation therewith, one of said storage way mounted panels of the selected storage way,
- whereby the individual panels may be individually transferred between said display frame way and said storage ways for individually disposing such panels at the frame open center for displaying both sides of the respective panels to the vehicle viewing area by swinging said frame about said vertical axis.

3,921,321

CONVERTIBLE SIGN

Ernst Weisskopf, Philippsburg, Germany, assignor to The Firm of Georg Merkel, successor to Johann Hawner, KG, Schwetzingen, Germany

Filed Jan. 21, 1974, Ser. No. 434,899
Claims priority, application Germany, Jan. 31, 1973, 2304570; Sept. 26, 1973, 2348374
Int. Cl.² G09F 11/00
U.S. Cl. 40—33 1 Claim

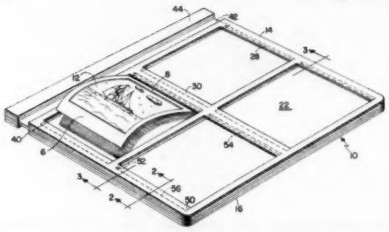


1. A convertible sign system comprising:
- A. an elongated prismatic element (6) comprising a plurality of flat faces adapted to carry indicia thereon, the prismatic element having a longitudinal axle (16) about which the prismatic element may be rotated,
- B. a Maltese cross (1) fixedly mounted on said longitudinal axle, whereby the prismatic element rotates when the Maltese cross rotates and remains fixed when the Maltese cross does not rotate,
- C. a housing (9) comprising an opening (25) for display through said opening of a selected one of the plurality of faces,
- D. a track means (10) mounted in the housing,
- E. a carriage (11) situated on and slideable along the track means,
- F. motive power means (23),
- G. driver means (3) powered by the motive power means (23) for rotating the Maltese cross, and therefore rotating the prismatic element, about the longitudinal axle,
- H. a yoke element (17) comprising two ends and a central portion having a longitudinal opening therein,
- I. means for pivotally mounting one end of the yoke element (17) on said longitudinal axle (16),
- J. a slide element (18) affixed to the other end of the yoke element (17), the slide element being slidably mounted on the track means (10), and
- K. an eccentric (19) powered by the motive power means (23) and connected to be operated simultaneously with the driver means (3), the eccentric being fitted into the longitudinal opening in the central portion of the yoke element (17),
- whereby, when the motive power means is operated to cause the driver means to engage the Maltese cross and thereby to rotate the prismatic element to convert the sign system by displaying a new face of the prismatic element, the eccentric simultaneously engages the longitudinal opening of the yoke, thereby causing the yoke to pull the carriage and the prismatic element back along the track means from the housing opening.

3,921,322
PHOTOGRAPHIC PRINT HOLDER

John R. Sharp, Squantum, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 5, 1973, Ser. No. 412,542
Int. Cl.² G09F 7/00
U.S. Cl. 40—104.19 4 Claims



1. A holder for photographic prints comprising: a flexible hinge including a coupler adapted to receive

fastening means for retaining said holder in a photograph album;

a pair of facing sheets each having at least one first aperture therein;

a pair of spacing sheets, substantially equal in size to said pair of facing sheets, each including second apertures having a greater dimension as measured in a first direction and equal in number to said first apertures; and

a backing sheet, slightly less as measured in one direction than said pair of spacing sheets, having one of said spacing sheets disposed on each side thereof, each said facing sheets being superposedly positioned and laminated to a second side of said spacing sheets with said first and second apertures in substantially symmetrical alignment whereby said greater dimension of said second aperture cooperating with a portion of said each side of said backing sheet and one side of said facing sheet define individual pockets at opposing ends of said first aperture for releasably receiving through said first aperture and thereupon restrictively retaining edge portions of the photographic prints on both sides of said holder, at least three edges of said backing, facing and spacing sheets being laminated coterminously to define a recess along one edge of said holder wherein one edge of said flexible hinge is positioned and secured therein.

3,921,323
HEADLIGHT NUMBER PLATE

Preston Lynn Petty, 403 N. Main St., Newberg, Oreg. 97132

Filed Apr. 29, 1974, Ser. No. 465,109
Int. Cl.² G09F 13/02
U.S. Cl. 40—204 6 Claims

1. A headlight number plate for mounting on fork members of motorcycles to provide illumination to identify the motorcycle comprising:

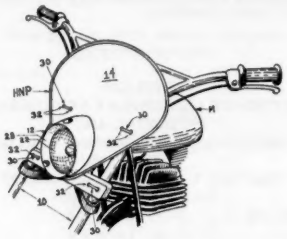
a plate member onto which indicia is to be provided;

a tubular headlight-mounting section provided by said plate member at one end thereof;

a headlight means in said tubular headlight-mounting section including securing means for removable securing said headlight means therein;

first positioning means extending outwardly from a rear surface of said plate member adjacent one side of said headlight-mounting section; and

second positioning means extending outwardly from said plate member adjacent another side of said headlight-mounting section; said first and second positioning means adapted to engage the motorcycle forks and position said headlight number plate thereagainst; and

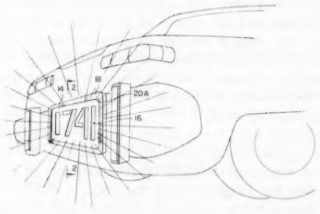


mounting means provided by said first and second positioning means for mounting the headlight number plate in position on the motorcycle forks.

3,921,324
ILLUMINATED LICENSE PLATE

Joe W. Flannery, Toronto, Canada, assignor to The Raymond Lee Organization, Inc., a part interest

Filed June 24, 1974, Ser. No. 481,958
Int. Cl.² G09F 13/02
U.S. Cl. 40—204 1 Claim



1. A license plate structure comprising:

a flat vertical inner member;

a parallel flat outer member spaced from the inner member, said outer member having openings defining letters, numbers or other indicia;

a flexible hollow translucent plastic tube defining a hollow rectangle and having two parallel vertically inwardly extending extensions with a removable translucent inner spacer liner disposed therebetween, said liner being disposed between said members and extending transversely between the outer edges of the two members to maintain spacing therebetween, said extensions detachably engaging the peripheries of both members along the outside surfaces of both members and functioning as a clip, said extensions and said liner holding the members together in spaced relationship;

a plurality of sockets extending through said liner into the space within the tube in spaced relationship;

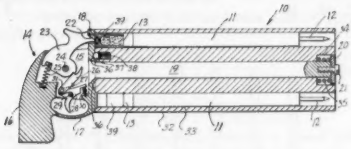
a like plurality of incandescent lamps, each lamp being disposed removably in a corresponding socket; and

electrically conductive means extending through said inner member into the region between the members and connected to said sockets whereby when an electric current is caused to flow in said means, the lamps are energizied and illuminate said indicia forming openings and said tube.

3,921,325
COMBINATION HIGHWAY FLARE AND PORTABLE FLARE GUN

Kalenen T. Tennigkeit, 4100 Foothill Blvd., Oroville, Calif. 95965

Filed July 15, 1974, Ser. No. 488,419
Int. Cl.² F41C *27/06*; F42B *4/26*
U.S. Cl. 42—1 Z **5 Claims**

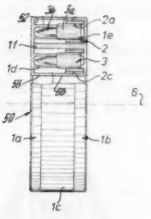


1. A combination highway flare and portable flare gun unit comprising a flare member having an elongate generally cylindrical burnable body ignitable at one end and a roadway penetrating spike projecting from the opposite end, said flare gun including a frame, a pistol grip integrally formed on said frame, a rotatable barrel member, means mounting said barrel member on said frame for rotation thereon, means on said frame for aligning said barrel member with said frame, a firing pin, and means on said frame for propelling said firing pin toward said barrel member to fire propelling and igniting cartridges mounted therein with said flare member.

3,921,326
CARTRIDGE HOLDER AND METHOD OF LOADING A FIREARM

Gerhard Hupp, Oberndorf, Neckar, and Helmut Mader, Schramberg, both of Germany, assignors to Industrie Werke Karlsruhe Augsburg AG, Germany

Filed Apr. 22, 1974, Ser. No. 463,112
Int. Cl.² F41C *25/00*
U.S. Cl. 42—89 **9 Claims**

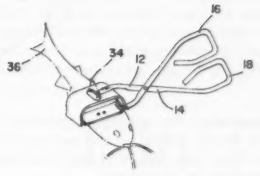


1. A cartridge holder for cartridges having a projectile portion, and a cartridge charge portion, for use in a firearm having a plurality of gun barrel loading chambers, comprising a first annular cover part having an interior side wall with a plurality of circumferentially spaced projectile receiving cylinders extending axially in respect thereto and distributed around the circumference thereof and being of a length and diameter corresponding to the length and diameter of the cartridge projectile portion, an intermediate annular body having a plurality of circumferentially spaced cartridge charge portion engaging cylinders engageable over the cartridge charge portion and extending beyond the end thereof on the side opposite the said projectile portion, a second annular cover part having a side adapted to face the first annular cover part with a plurality of stub cylinders extending axially therefrom engageable within the cartridge charge portion engaging cylinders, said first annular cover part being separable axially from the projectiles and said second annular cover part for exposing the projectiles for insertion simultaneously into the barrel loading chambers, said first annular cover part projectile receiving cylinders being of a diameter to be engageable into the cartridge charge portion engaging cylinders of said intermediate annular body to dislodge the cartridge charges from said body and insert them into the gun barrel loading chambers.

3,921,327
FISH HOLDER

Nello Louis Casazza, 5532 Manila Ave., Oakland, Calif. 94618

Continuation-in-part of Ser. No. 359,500, May 11, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,527
Int. Cl.² A01K *97/00*; A22C *25/00*
U.S. Cl. 43—4 **7 Claims**



1. A catfish holder comprising a pair of handles, means pivotally securing said handles together for movement in a first plane normal to the axis of said means, each of said handles having a cooperating jaw element at an end thereof, one of said jaw elements comprising a first substantially flat plate-like member lying in a plane normal to the plane of movement of said handles, the other of said jaw elements comprising a second substantially flat plate-like member parallel to and spaced from said first jaw element when said handles are in their closed operative position, said second member having an aperture therein spaced medially of the same, and said second member further having flanges extending generally normal to said member and terminating adjacent the ends of said first member when said handles are in their closed operative position, the distal ends of said first plate diverging upwardly and outwardly.

7. A fish holder comprising a pair of handles, pivot means securing said handles together for rotation in a first plane, each of said handles having a cooperating jaw element at an end thereof, one of said jaw elements comprising a first plate-like member disposed in a plane normal to said first plane, the other of said jaw elements comprising a second C-channel member having a web parallel to said first member and a pair of sides extending normally from opposed edges of said web to define a channel cavity, said web including an aperture disposed centrally therein, and said first member extending substantially between the distal edges of said sides when said handles are in their closed operative position.

3,921,328
LUMINESCENT FISHING LURE

Gordon B. Holcombe, 603 Santa Barbara Ave., Millbrae, Calif. 94030

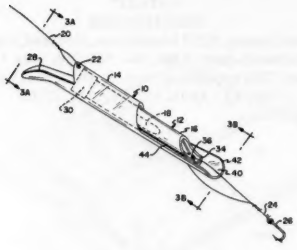
Continuation-in-part of Ser. No. 364,748, May 29, 1973, Pat. No. 3,861,072. This application July 31, 1974, Ser. No. 493,322
Int. Cl.² A01K *85/00*
U.S. Cl. 43—17.6 **6 Claims**

1. An illuminated fishing lure attachable to a fishing line for attracting fish, squid and other aquatic life comprising:

a chemiluminescent wand having a first chemical in an inner frangible tube and a second chemical in an outer flexible casing encompassing the inner tube, wherein the chemicals when mixed, by deforming the outer casing and fracturing the inner tube, generate a chemiluminescence;

a tubular sheath having a trailing end and a curved leading end, and being mounted about a portion of the chemi-

luminescent wand for causing the wand and sheath to submerge and wobble when the sheath and wand are moved relative to the water, the trailing end of the sheath partially encompassing the wand and having non-parallel



longitudinal edges for causing an unstable, imbalance of the water forces acting on the lure when it is moved relative to the water, the wand and sheath together being less dense than the water; and

means for attaching the wand and sheath to the fishing line.

3,921,329

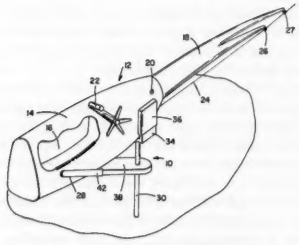
FISHING ROD HOLDER

James J. Looby, and Michael J. Looby, both of 107 Silverview Court, Vallejo, Calif. 94590

Filed Feb. 24, 1975, Ser. No. 552,470

Int. Cl.³ A01K *97/10*

U.S. Cl. 43—21.2 **5 Claims**



1. A holder for a rod/reel device having a handle portion including an integral reel and a rod portion adapted to fold outward from the handle portion, the handle portion of the device being provided with a slit for mounting the device on the belt of a fisherman for carrying of the device when not in use, said holder comprising:

a shaft having a pointed end adapted to be inserted into the ground for mounting the shaft in a substantially vertical configuration;

an upwardly opening cradle fixed to the end of the shaft opposite from the pointed end and adapted to receive and support the forward end of the handle portion of the rod/reel device; and

a rearwardly projecting tab having one end fixed to the shaft and an opposite free end adapted to be inserted into the slit in the handle portion of the rod/reel device, the thickness of the free end of the tab being preselected so that said free end is press fit into the slit to prevent sliding of the rod/reel device with respect to the cradle when placed thereupon.

3,921,330

FRAMED RODS WITH BLOCKS FORMING A MOSAIC TOY

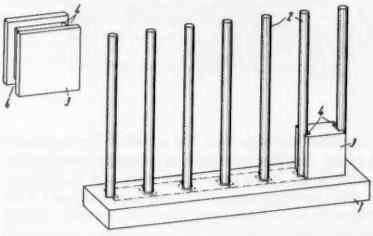
Hieronimus Robert Drieze, Haaksbergerstraat 219-221, Enschede, Netherlands

Filed Nov. 29, 1972, Ser. No. 310,385

Claims priority, application Germany, May 31, 1972, 7220330[U]; Sept. 2, 1972, 7232502[U]

Int. Cl.³ A63H *33/12*

U.S. Cl. 46—16 **1 Claim**



1. A toy comprising in combination the following:

a frame having a base on which rods of the same cross section are arranged vertically in a row at equal distances each from another thereof,

a large number of parallelepipedic blocks each having a square face with a length substantially equal to the distance between adjacent of the rods and each block having four sides,

each of the blocks having a groove on each of its sides, each of which groove is disposable to half surround one of the rods,

each of the blocks provided on its face with puzzle-like patterning of different coloring.

3,921,331

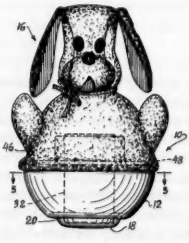
WEIGHTED, MUSICAL ROLY-POLY TOY CONSTRUCTION

Joel Schatz, Forest Hills, N.Y., assignor to Knickerbocker Toy Co. Inc., Middlesex, N.J.

Filed Nov. 25, 1974, Ser. No. 526,469

Int. Cl.³ A36H *3/28*

U.S. Cl. 46—117 **5 Claims**



1. A roly-poly toy construction, comprising:

a. a hollow base externally rounded to enable it to rock on a flat horizontal surface;

b. a socket formed within said base, centrally thereof,

c. a collar formed on said base in axial alignment with and above said socket,

d. a tubular cartridge mounted within the base, its lower end projecting into said socket and its upper end received within said collar, whereby the tubular cartridge is se-

cured to said base, centrally thereof, and coaxially therewith and is rockable therewith,

e. a weight secured within the lower end of said tubular cartridge,

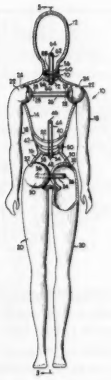
f. musical sound producing means including a plurality of sound emitting members and a hammer member adapted to strike said sound emitting members mounted in said tubular cartridge and adapted to produce musical sounds when the roly-poly rocks, and

g. a toy character mounted on said base and rockable integrally therewith.

3,921,332
ARTICULATED FIGURE TOY

Rouben T. Terzian, Chicago, Ill.; Marvin I. Glass, deceased, late of Chicago, Ill., and Ernest Sonderling, executor, Highland Park, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation-in-part of Ser. No. 402,393, Oct. 1, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,825
Int. Cl.² A63H *3/46*
U.S. Cl. 46—161 **9 Claims**



1. A combination doll part and joint structure for connecting parts of toy figures or the like, comprising:

a first toy figure part having a generally concave socket-type portion at said joint;

a second toy figure part having a generally convex portion at said joint;

at least one intermediate joint member disposed between said first and second toy figure parts at said joint, said member being generally cup-shaped providing a generally convex side for positioning in the concave portion of said first toy figure part, said convex side being the sole engagement of said member with said concave portion, and a generally concave side for receiving the convex portion of said second toy figure part, said concave side being the sole engagement of said member with said convex portion to provide for relative movement between both toy figure parts as well as between each part and said member; and

retaining means interconnected between said toy figure parts to hold said parts and said intermediate member together at said joint and give universal movement thereto.

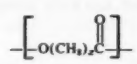
3,921,333
TRANSPLANTER CONTAINERS MADE FROM BIODEGRADABLE-ENVIRONMENTALLY DEGRADABLE BLENDS

Robert A. Clendinning, New Providence; James E. Potts, Millington, and Stephen W. Cornell, Dunellen, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 275,951, July 28, 1972, Pat. No. 3,867,324. This application Dec. 9, 1974, Ser. No. 531,169
Int. Cl.² A01C *11/00*; C08L *23/00, 67/04*
U.S. Cl. 47—37 **31 Claims**

1. A transplanter container which has a medium to germinate and grow seeds or seedlings therein and which is formed from a biodegradable-environmentally degradable blend comprising (i) from about 5 to about 95 weight percent of biodegradable thermoplastic polymer, said polymer having a reduced viscosity value of at least about 0.1 and upwards to about 12 and being further characterized in that at least about 10 weight percent of said biodegradable thermoplastic polymer is attributable to recurring units of the group consisting of (a) dialkanoyl units of the formula

wherein R represents a divalent aliphatic hydrocarbon radical; and wherein R' is of the group consisting of divalent aliphatic hydrocarbon radicals and divalent aliphatic oxahydrocarbon radicals, and (b) oxyalkanoyl units of the formula



wherein x is an integer having a valaue of 2 to 7, with the proviso that x does not equal 3; and (ii) from about 95 to about 5 weight percent of an environmentally degradable ethylene polymer based composition comprised of

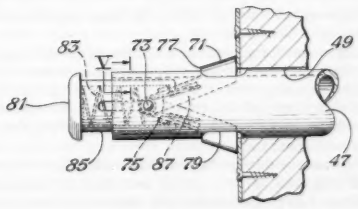
A. at least about 70 weight percent of normally solid thermoplastic ethylene polymer of the group consisting of (a) polyethylene, (b) copolymers containing a major amount by weight of ethylene and a minor amount by weight of unsaturated monomers copolymerizable therewith, and (c) mixtures thereof, and

B. at least one polyvalent transition metal salt in which said metal has an atomic number of from 21 to 30, 39 to 48, and 57 to 71.

3,921,334
WINDOW GUARD APPARATUS

William R. Black, Sr., 3523 Livingston Ave., Fort Worth, Tex. 76110

Filed Feb. 6, 1974, Ser. No. 440,012
Int. Cl.² E06B *9/02*; E05C *3/28*
U.S. Cl. 49—56 **3 Claims**



1. A guard for a window in a building or the like comprising:

a. a guard element traversing the length and width of said window and being adapted to prevent entry into said window from the exterior of said building;

b. hinged mounting means hingedly mounting said guard element adjacent one of its edges onto a wall adjacent said window for pivotal movement of said guard element outwardly to provide emergency egress through said window; and

c. releasable fastening means connected with said guard element at another of its edges and protruding interiorly of said building so as to be releasable from the inside of said building; said releasable fastening means being inaccessible from the outside of said building and being operable by even a child without tools from inside said building; said releasable fastening means including an interiorly protruding shaft and an interiorly releasable latch; said latch comprising locking dogs that are biased outwardly to block egress of said interiorly protruding shaft when in the normal latched position and an interiorly accessible release member that is adapted to effect retraction of said dogs for release for emergency egress; said locking dogs being pivotally mounted from a pin shaft by suitable arms and said releasable latch including a push button with a depending skirt that rides outwardly on said arms and about said pin shaft and effects retraction of said dogs when pushed outwardly by a person inside said building.

3,921,335

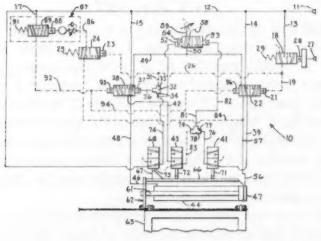
AIR OPERATED DOOR OPENER

Lew V. Hewitt, and Dee D. Horton, Jr., both of Corpus Christi, Tex., assignors to Overhead Door Corporation, Dallas, Tex.

Filed Oct. 24, 1973, Ser. No. 409,245

Int. Cl.² E05F *15/02*

U.S. Cl. 49—265 **8 Claims**



1. A pneumatically operated system for controlling a pneumatic cylinder having a double acting piston connected to a door to move said door between open and closed positions, the movement of which is initiated by a pressure sensitive mat which is depressed to open said door, comprising:

a source of pressurized air;

means for sensing the depression of said mat and producing a signal in response thereto;

valve means responsive to said signal to effect a directing of a supply of said pressurized air to one end of said pneumatic cylinder and to effect opening movement of said door;

timing means for generating a change signal at the end of a preselected time period following the discontinuation of the depression of said mat and the effecting a redirecting of said supply of said pressurized air to the other end of said pneumatic cylinder and to effect a closing movement of said door; and

three door position sensing means for detecting the position of said door, a first one of said door position sensing means being adjacent the fully opened position, a second one of said door position sensing means being adjacent the fully closed position, a third one of said door position sensing means being at the fully closed position, said first and second door position sensing means including a single valve having a restricted first outlet connected to the atmosphere and a second unrestricted outlet connected to the atmosphere, said first and second door position sensing means connecting the exiting air from said system to said restricted first outlet when the position of said door is adjacent the fully open and closed positions during a door opening and door closing operation, respectively, and connecting the exiting air from said system to said second unrestricted outlet connected directly to the atmosphere when the position of said door is between said positions adjacent said fully opened and fully closed positions, said third door position sensing means connecting both ends of said pneumatic cylinder to said atmosphere through said second outlet when said door is at said fully closed position.

3,921,336

METHOD AND APPARATUS FOR BLASTING

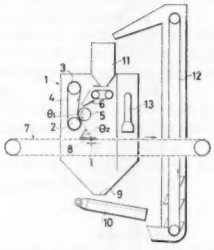
Yasuhiro Nishio, Tokyo; Hirosi Yonekubo, Kawasaki; Takeo Matuzawa, Shiojiri; Tosiki Hanamura, Shiojiri, and Kunimoto Ishibayashi, Shiojiri, all of Japan, assignors to Showa Denko Kabushiki Kaisha and Kyoei Kenmazai Company, Limited, both of Tokyo, Japan

Filed July 31, 1974, Ser. No. 493,391

Claims priority, application Japan, Aug. 9, 1973, 48-88837

Int. Cl.² B24C *1/00, 3/14, 5/06*

U.S. Cl. 51—9 R **4 Claims**



1. A method for blasting, which comprises:

disposing (1) an endless belt supported in position by two rollers, (2) a contact roller held in contact against said endless belt at a point separated from the zones in which said endless belt comes into contact with said supporting rollers, (3) an abrasive feeder the opening of which is directed toward the point at which said contact roller and said endless belt reach the starting point of contact when said endless belt is put to motion and (4) an object subjected to blasting treatment which is positioned at a distance from the point at which the contact between said contact roller and said endless belt terminates and causing said endless belt to revolve and said contact roller to rotate at substantially the same high rate of speed and in opposite directions, and at the same time allowing the abrasive feeder to discharge the abrasive for thereby delivering said abrasive between the mutually approaching surfaces of said contact roller and said endless belt, whereby the abrasive is projected at a high rate of speed by means of the momentum of the motion of said roller and said endless belt so as to impinge upon the object being treated.

2. An apparatus for blasting, which comprises:

1. a device for projecting an abrasive, consisting of (a) a roller, (b) an adjusting roller positioned at a distance from said roller and movable so as to permit adjustment of said distance from said roller, (c) an endless belt held in position by said roller (a) and said adjusting roller (b), (d) a contact roller held in contact against said endless belt (c) at a point separated from the zones in which said endless belt comes into contact with said rollers (a) and

(b) and movable so as to permit adjustment of the strength with which the contact roller is kept in contact with the endless belt and (e) a feeder having an opening directed toward the point of contact between said endless belt and said contact roller and disposed so as to permit the abrasive to be fed in the direction of the travel of the endless belt,

2. a means for accommodating the object subjected to blasting treatment, which means is separated by fixed distances from said roller and said contact roller and disposed opposite from said feeder with reference to said roller and said contact roller,
3. a blasting chamber containing therein said device for projecting the abrasive and said means for accommodating the object,
4. a hooper disposed above said feeder and provided with a means for delivering into the feeder its contents,
5. a discharge outlet formed at the bottom of the blasting chamber and adapted to discharge the used abrasive from within the blasting chamber,
6. a means adapted to form a path leading from said discharge outlet to said hopper for thereby returning to said hopper what has been discharged from said discharge outlet and
7. a driving means for imparting high-speed rotations to the rollers and said endless belt, said rollers and said belt being driven at substantially the same rate of speed and in opposite directions.

3,921,337

CENTRIFUGAL BLASTING APPARATUS

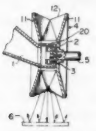
Riichi Maeda, 30-1, Kitakata 2 chome, Ichikawa, Chiba 272, Japan

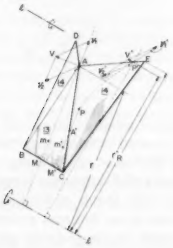
Filed Dec. 30, 1974, Ser. No. 537,421

Claims priority, application Japan, May 17, 1974, 49-54454; May 17, 1974, 49-54455; May 17, 1974, 49-54456; July 19, 1974, 49-82284

Int. Cl.² B24C 5/06

U.S. Cl. 51—9 R **6 Claims**





1. A centrifugal blasting apparatus including a chute, a stationary hollow cylindrical deflector connected at one opening end thereof to said chute for receiving therewithin abrasive particles fed via said chute and provided with a feed slot formed through the peripheral wall thereof, a rotatable impeller positioned within said deflector with the axis of rotation thereof coinciding with the axis of the deflector for hurling the abrasive particles through said feed slot, a drive shaft carrying said impeller, and a rotatable blast wheel fixed to said drive shaft so as to be positioned cocentrically with said deflector and rotated together with said impeller, said blast wheel comprising:

a. a pair of disks, one of said disks being fixed to said drive shaft; and
b. a plurality of vanes extending between said disks, attached thereto and spaced equiangularly from each other, said vanes each comprising a central face of a substantially isosceles triangle configruation and a pair of substantially triangular sloping faces extending from the respective equal sides of said central face, at least a part of each of said sloping faces slanting laterally and backwards with respect to the direction of rotation of said blast wheel, the distance between a pair of apexes of said sloping faces which are opposite to the equal sides of said central face being longer than the length of the bottom edge of said central face, the distance from one of said pair of apexes of said sloping faces to the bottom edge of said central face being longer than the height of said central face between the top apex thereof and the bottom edge, and said vanes being attached to said pair of disks at the sides of the sloping faces opposite to the top apex of said central face in such a way that the bottom edge of said central face is parallel with the axis of rotation of said blast wheel and also that the top apex of said central face is positioned opposite to the axis of rotation with respect to the bottom edge of said central face.

3,921,338

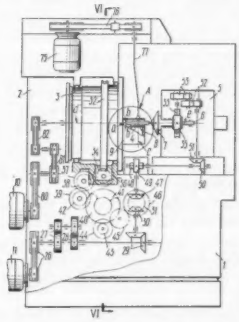
STRAIGHT BEVEL GEAR GRINDING MACHINE

Vasily Nikolaevich Kedrinsky, ulitsa Vavilova, 93, kv. 23, and Ivan Dmitrievich Zakharov, Kavkazsky bulvar 41, korpus 1, kv. 5, both of Moscow, U.S.S.R.

Filed Aug. 27, 1973, Ser. No. 392,059

Int. Cl.² B23F 5/10

U.S. Cl. 51—33 W **8 Claims**



1. A straight bevel gear grinding machine for generating gear teeth by means of an abrasive disk tool, comprising; a main drive; a spindle arranged to mount an abrasive disk tool and receive a rotational motion from said main drive, said spindle and abrasive disk tool being adapted to revolve about their axis of rotation; a bed; a cradle mounted on said bed and adapted to impart a generating motion to said abrasive disk tool; a workhead spindle arranged to mount the work, said spindle being mounted on said bed and kinematically connected with said cradle; a carriage mounting said spindle with said abrasive disk tool, said carriage being arranged on said cradle so as to impart to said abrasive disk tool a reciprocating motion along the gear tooth being ground, said abrasive disk tool comprising substantially a grinding wheel with a cylindrical peripheral face formed between taper side surfaces and being adapted for set-over movement along its axis of rotation, said kinematic connection being provided to turn said cradle through an angle corresponding to and simultaneously with said axial set-over movement of the grinding wheel to complete thereby the set-over from grinding one side of bevel gear tooth to the other, whereby the single abrasive disk tool is

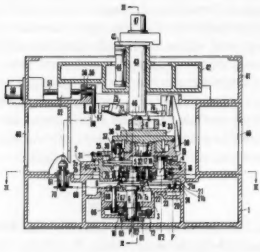
enabled to grind both sides of the gear tooth at one setting of the work.

3,921,339

APPARATUS FOR GENERATING TROCHOIDAL SURFACES

Makoto Kikuchi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Japan

Filed July 15, 1974, Ser. No. 488,844
Claims priority, application Japan, July 20, 1973, 48-81133
Int. Cl.² B24B *19/08, 41/06*
U.S. Cl. 51—34 J **7 Claims**



1. In an apparatus for generating a trochoidal surface, said apparatus being of the type including an oscillating table movable in a plane; a crank mechanism means having an eccentric shaft connected with said oscillating table for imparting an orbital motion to said oscillating table; said crank mechanism means being provided with an eccentric coupling means for selectively adjusting the eccentricity of said eccentric shaft, a main spindle rotatably mounted on said oscillating table; gear transmission means for drivably connecting said eccentric shaft with said main spindle in a circumscribed gear relationship; and means for controlling the orientation of said oscillating table with respect to said orbital motion; the improvement comprising:

a support head rotatably supporting said main spindle and slidably mounted on said oscillating table;

regulating means for selectively positioning said support head relative to said oscillating table for thereby adjusting the space between said main spindle and said eccentric shaft; and

a universal coupling means associated with said gear transmission means for maintaining a rotational ratio between said main spindle and said eccentric shaft at a predetermined value at any desired adjusted position of said support head.

3,921,340

MAGNETIC HEAD SURFACE FORMATION APPARATUS AND METHOD

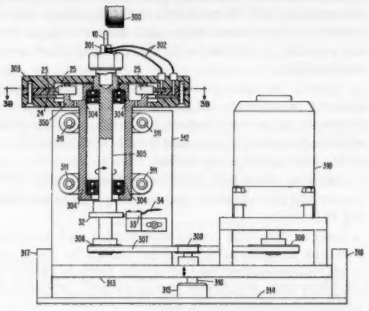
Larry A. Johnson, Longmont; Neil L. Robinson, Boulder; Richard H. Strang, Arvada, and Gary G. Vair, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1974, Ser. No. 450,139
Int. Cl.² B24B *49/10*
U.S. Cl. 51—165 R **23 Claims**

19. Manufacturing apparatus for forming the surface contour of a transducer by monitoring the resistance of the transducer while the transducer contacts a material removing device, comprising:

a rotatable retainer for fixedly retaining the transducer and rotating the transducer more than 360°;

at least two slip rings fastened to the retainer and connected to two electrical leads of said transducer; and



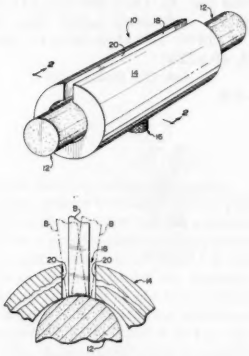
at least eight electrical contacts connected together into four pairs, two pairs contacting each slip ring.

3,921,341

ICE SKATE HONING TOOL

Arnold M. Thompson, ON 181 - Gary Ave., Wheaton, Ill. 60187

Continuation of Ser. No. 286,932, Sept. 7, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,508
Int. Cl.² B24B *9/04*
U.S. Cl. 51—205 WG **2 Claims**



1. A honing tool adapted abrasively to hone the concavity in the hollow ground skating edge of an ice skate blade of predetermined thickness, said honing tool comprising an elongated cylindrical rod-like honing stone, an elongated tubular holder having said stone extending longitudinally therethrough and having an internal cylindrical wall surface the diameter of which is appreciably greater than that of the stone, said holder being provided therein with a longitudinally extending, full length slot of a width slightly greater than that of the skate blade which is to honed, said slot being designed for longitudinal sliding reception of the skate blade, said slot presenting a pair of planar, opposed, parallel side faces which are equally spaced from a medial diametric plane of the cylindrical honing stone, the depth of said slot being appreciably greater than the width of the slot, the longitudinal extent of said honing stone being appreciably greater than that of the holder and the former projecting completely through the latter so that its opposite end regions overhang the end faces of the holder, and releasable clamping means bearing against the outer cylindrical side of said cylindrical honing stone, and

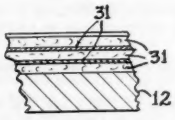
serving to force the latter against the inner edges of said slot, thereby closing the slot and establishing an abrasive bottomed, blade-receiving channel having its side surfaces defined by the opposed side faces of the slot and a convex bottom defined by the intervening portion of the periphery of the honing stone, the radius of curvature of said honing stone being less than that of the concavity of the hollow ground skating edge of the blade, and the dimensional relationship between the width and depth of said channel and the thickness of the skate blade being such that limited side-to-side rocking movement of the blade in the channel during skate sharpening operations is permitted to occur while at the same time the invervening portion of the honing stone is, in all skate sharpening positions, positively confined to abrasive contact with the hollow ground skating edge variously in the medial positions of the latter without possible contact of said intervening portion of the stone with the adjacent side corners or edges of the skate blade.

3,921,342

LAP PLATE

Lawrence Day, Mount Prospect, Ill., assignor to Spitfire Tool & Machine Co., Inc., Chicago, Ill.

Filed Dec. 17, 1973, Ser. No. 425,328
Int. Cl. B24d *7/06*
U.S. Cl. 51—209 DL **2 Claims**



1. A rotatable lap plate for a lapping machine over which an abrasive liquid is caused to flow during a lapping operation, comprising

a. a substantially circular body carried in a horizontal plane by the machine and providing a working surface over which the abrasive liquid flows,

b. means formed in said body interrupting said working surface and into and through which the abrasive liquid flows from said working surface,

c. a removable filler in said means below said working surface of said body determining the depth of said means so as to regulate the amount of abrasive liquid flowing therethrough and being gradually removable so as to maintain its relation to said working surface and the depth of said means in relation to the wear of said working surface of said body caused by the lapping operation,

d. and removable means embedded in said filler separating it into individual readily removable strips.

3,921,343

HOT MELT COMPOSITIONS

Fred B. Speyer, Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 25, 1974, Ser. No. 436,512
Int. Cl.² B24B *19/14*; **C08L** *91/00*
U.S. Cl. 51—323 **4 Claims**

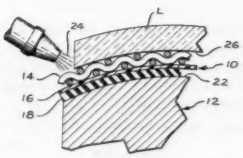
1. The method of fixturing a device for subsequent mechanical processing which comprises supporting said device in a holder, applying a molten fixturing composition onto at least portions of said device while so held, said composition comprising the reaction product of a methylolurea with at least one saturated fatty acid containing from 12 to 20 carbon atoms per molecule, said monomethylol urea having a molar ratio of formaldehyde to urea of 1:2 to 3:1, said reaction product being a rigid solid at room temperature but being readily melt-flowed at elevated temperatures, together with a hard wax, a hydrocarbon resin, a flexible polymer and an inorganic filler, and solidifying said composition about said device.

3,921,344

LENS SURFACING PADS AND METHOD OF MAKING THE SAME

Bertram R. Goodwin, Feeding Hills, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 14, 1973, Ser. No. 359,825
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B24D *11/02, 17/00, 9/00*
U.S. Cl. 51—395 **14 Claims**



1. A disposable lens surfacing pad comprising the laminate of:

a sheet of foraminous material;

a thin, imperforate film of highly abrasion and puncture resistant material sealed to one side only of said sheet of foraminous material, the opposite side of said sheet being fully exposed for direct contact with a lens to be surfaced; and

a layer of adhesive on said film for detachably securing said pad to said rigid lens surfacing tool as a tool facing; whereby

said film component of said laminate prevents the material of said adhesive from penetrating said sheet of foraminous material and contaminating a lens placed thereagainst under pressure for surfacing by said tool.

12. The method of making a disposable lens surfacing pad comprising the steps of:

bringing a sheet of foraminous material and a thin, imperforate film of highly abrasion and puncture resistant material flatly into side-by-side relationship with each other;

heating the combination of said sheet of foraminous material and film and pressing the combination together at a temperature and with a pressure suitable for effecting a bond therebetween to attach said film to one side only of said sheet of foraminous material, leaving an opposite side of said sheet fully exposed; and

applying a layer of adhesive material to said film.

3,921,345

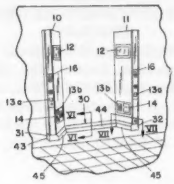
HOSPITAL BED SERVICE UNIT

Frank M. Damico, Hull, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed July 18, 1973, Ser. No. 380,356
Int. Cl.² A47B *83/00*; **A61G** *7/06*; **E04F** *19/00*
U.S. Cl. 52—28 **8 Claims**

1. A three-component hospital bed service unit comprising a pair of separate service pylons having electrical and lighting facilities therein; a wall-mountable support bracket, said bracket having an elongated back plate, a pair of horizontal shelf portions extending outwardly at predetermined horizontally spaced positions from said back plate, and means for securing said plate generally horizontally against a wall, said shelf portions having means for supporting and securing said pylons on the tops thereof, each shelf portion supporting one of said pylons from beneath such that each pylon extends vertically upwardly adjacent the wall, said bracket having

securing means for supporting and holding said shelf portions and pylons in said predetermined horizontally spaced relationship on said back plate to receive the head of a bed therebetween and generally adjacent said back plate to enable a



patient to use said electrical and lighting facilities whereby said back plate can be attached to said wall with said shelf portions secured in said horizontally spaced positions on said back plate, and said pylons thereafter individually set on and secured to said shelf portions.

3,921,346

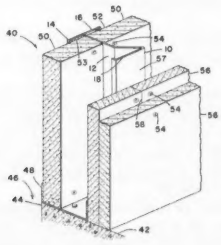
FIRE RETARDANT SHAFT WALL

Gale E. Sauer, and Carl R. Mapes, both of Kenmore, N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Division of Ser. No. 198,483, Nov. 12, 1971, Pat. No. 3,740,912, Continuation of Ser. No. 34,656, May 5, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,658

Int. Cl.[2] E04B *2/28, 2/80*

U.S. Cl. 52—30 **14 Claims**



1. An air shaft cavity wall in a building generally surrounding a vertical air shaft extending continuously through at least two stories and subjected to destructive wind loading, the wall comprising at least one floor and adjacent ceiling cut away to define the continuous shaft therethrough, a plurality of liner panel members, a plurality of studs engaging the liner members, at least one partition member spaced away from the liner members by the studs so as to form an air gap between the partition member and a corresponding one of the liner members, means for mounting the stud in a vertical disposition, said stud-mounting means comprising a floor runner attached to said floor, and means permitting said liner members and the studs to be inserted within the runner from only the side of the wall opposite to the shaft side.

3,921,347

PARTITION CONSTRUCTION

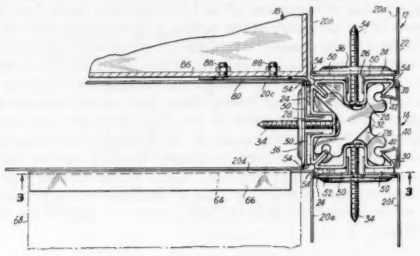
John C. Paisley, Orange, Va., assignor to Gray Manufacturing Company, Orange, Va.

Filed May 31, 1974, Ser. No. 475,317

Int. Cl.[2] E04B *2/78*

U.S. Cl. 52—36 **12 Claims**

1. A partition structure including a support post and a partition panel secured thereto, said panel having a bent flange portion which is located in parallel closely spaced alignment with one side of said post to define a thin cavity therebetween, and a single flat elongated bracket support strip located in and substantially filling said cavity and secured only to said one side of the post; said strip including an outwardly facing exposed edge having a plurality of generally L-shaped



recesses formed therein, said recesses each having a first leg extending perpendicularly of said edge and a second leg extending downwardly from the first leg and inwardly of said edge for receiving the generally complementary L-shaped tabs of a bracket.

3,921,348

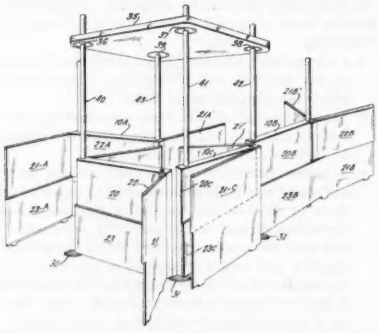
DOUBLE-HINGED, MODULAR PANEL SYSTEM ESPECIALLY SUITED FOR PLAYGROUNDS AND PLAYROOMS

Aaron Kurzen, Stony Creek, Conn., assignor to Space-A-Maze, Inc., New York, N.Y.

Filed May 13, 1975, Ser. No. 577,027

Int. Cl.[2] E04B *1/344*

U.S. Cl. 52—64 **5 Claims**



1. As a structural unit for the construction of play houses and mazes in play areas, a rigid rectilinear frame adapted to be supported in upright position, the lower side of said frame comprising a projection at one end thereof adapted to form part of a rotating joint, the other end of the lower side of said frame containing castor means, the upper side of said frame opposite said projection comprising pole supporting means whereby the frame may be supported from above by a pole held in the pole supporting means; a stationary panel attached to cover the opening in the frame, a first pivotable panel of approximately the same size as the staionary panel attached to said first side for pivoting about two vertical axes by a Jacobs-ladder type of double hinge whereby said pivotable panel may be opened in a clockwise or counterclockwise direction with respect to the stationary panel, a second pivotable panel corresponding to said first pivotable panel attached to the second side of said frame for pivoting about two vertical axes by a Jacobs-ladder type of double hinge.

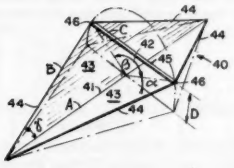
3,921,349
STRUCTURAL COMPONENT AND STRUCTURES COMPRISING THE SAME

Arpad Kolozsvary, 180 Morris Ave., Mountain Lakes, N.J. 07046

Continuation-in-part of Ser. Nos. 789,845, Jan. 8, 1969, Pat. No. 3,557,501, and Ser. No. 109,169, Jan. 25, 1971, Pat. No. 3,729,876, which is a division of Ser. No. 789,845,. This application Jan. 25, 1971, Ser. No. 109,305

Int. Cl.² E04B *1/32, 1/342*

U.S. Cl. 52—81 **18 Claims**



1. A structural component comprising
   a. a first triangular portion having a long straight side extending between two apices and two shorter sides meeting at a third apex,
   b. a second triangular portion similar to the first triangular portion having a long straight side extending between a first apex and a second apex and two shorter sides meeting at a third apex,
   c. means connecting the long side of the first triangular portion to the long side of the second triangular portion to hold the connected sides in coinciding relation,
   d. hinge means included in means (c) whereby the connected triangular portions form a folded plate component in which the fold angle is adjustable,
   e. restraining means connected to the first triangular portion in the neighborhood of the third apex, of the first triangular portion and
   f. means associated with the second triangular portion in the neighborhood of the third apex of the second triangular portion for coaction with restraining means (e) to hold the first and second triangular portions at a given fold angle to one another against at least some forces tending to alter the angle.

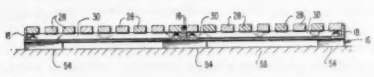
3,921,350
METHOD AND APPARATUS FOR PROVIDING A SANITARY ELEVATED FLOORING SYSTEM

Quentin H. Van Schoyck, Christmas, Fla., assignor to Cylpik, Incorporated, Winter Park, Fla.

Filed Aug. 23, 1973, Ser. No. 390,758

Int. Cl.² E04F *15/04*

U.S. Cl. 52—180 **3 Claims**



1. An elevated flooring system operable to be positioned upon a conventional flooring surface to provide an elevated tread comprising:
   frame means directly engageable with and supported upon and above a conventional, planar flooring surface; and
   a plurality of individual flooring modules each comprising,
   a first plurality of substantially parallel, spaced apart, flexurallly resilient, wooden coplanar slats,
   a second plurality of substantially parallel, spaced apart slats transversely extending across and interconnecting said first plurality of slats into a unit;
   said unit affording a substantially planar tread surface elevated above the conventional flooring, said unit being dimensioned to be snugly received within said frame means to prevent skewing and shifting thereof while supporting a person walking thereon; and said unit being further dimensioned to be manually removable from said frame means and receivable for cleaning within a continuous pass through dishwasher;
   a water, grease, and alcohol resistant coating of epoxy completely covering each of said wooden flooring modules; and
   a strip of aggregate embedded within said epoxy coating covering the uppermost surface of each of said first plurality of slats to provide a slip resistant tread for the substantially planar tread surface of said at least one flooring module.

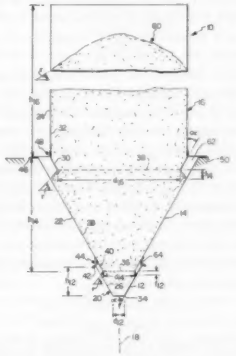
3,921,351
SEGMENTED STORAGE BIN

Walter E. Johnson, Wayne, N.J., assignor to H. F. Henderson Industries, West Caldwell, N.J.

Filed Dec. 20, 1973, Ser. No. 426,583

Int. Cl.² B65D *87/00;* **B67C** *11/00;* **B65B** *39/04*

U.S. Cl. 52—197 **7 Claims**

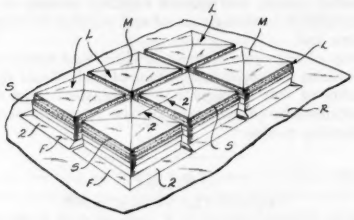


1. A segmented storage bin for storing and dispensing a particulate material comprising:
   a. a first bin segment containing said particulate material, comprising a first hollow body portion having a closed cross-section, a first orifice at the bottom of said first hollow body portion, and a first opening at the top of said first body portion; and
   b. a second bin segment containing said particulate material, positioned above said first bin segment and securely fastened to said first bin segment, comprising a second hollow body portion having a closed cross-section, and a second orifice at the bottom of said second hollow body portion, said second orifice being smaller than said first opening to thereby permit the free flow of said particulate material from said second bin segment into said first bin segment; wherein said first orifice has a minimum dimension d_1, which is equal to the diameter of the largest circle that can be inscribed in said first orifice and which, measured in feet, is no less than one-third the angle of repose of said particulate material measured in degrees, divided by the density of said particulate material, measured in pounds per cubic foot and wherein said second bin segment is partially nested within said first bin segment so that a de-aerating chamber is created between the outside of said second body portion and the inside of said first body portion to thereby permit gases trapped within said particulate material to escape into said de-aerating chamber.

3,921,352
GLAZING SYSTEM

Herbert J. Koopman, and Elbert E. Picker, both of St. Louis, Mo., assignors to E. J. Products Corporation, St. Louis, Mo.

Filed Sept. 4, 1973, Ser. No. 394,071
Int. Cl.² E06B *3/62*, *7/14*
U.S. Cl. 52—200 **20 Claims**

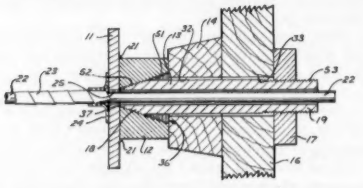


1. A glazing seal for securing a glazing material to a supporting structure having a groove therein, said seal comprising: a base sized to fit into the groove in the supporting structure and including a pair of retainers which are engageable with the sides of the groove to firmly retain the base in the groove and a lock strip which moves from a contracted condition wherein the retainers are relatively close together to an expanded condition wherein the retainers are spread further apart and tightly engage the sides of the groove; a glazing receiver having a glazing channel in which the edge of the glazing material is received; and at least two substantially parallel legs of substantially equal length interconnecting the base and the receiver and being presented at an angle with respect to the lateral direction of the glazing channel and that portion of the glazing material in the glazing channel, the legs being flexible adjacent to the base and receiver so that the legs together with the base and receiver from a parallel linkage arrangement which enables the receiver to move relative to the base and still maintain substantially the same angular disposition with respect to the glazing material.

3,921,353
TENDON ANCHORAGE ASSEMBLY AND BORE MOUNTING APPARATUS THEREFOR

George H. Howlett, and James W. Howlett, both of Oakland, Calif., assignors to Howlett Machine Works, Berkeley, Calif.

Filed Feb. 4, 1972, Ser. No. 223,584
Int. Cl.² E04C *3/10*; E04B *1/38*
U.S. Cl. 52—223 **2 Claims**



1. In a tendon anchorage assembly to be cast-in-place in a concrete member, said assembly including anchorage means having a wall defining an axially convergently tapered bore providing a supporting surface for mounting of tendon gripping wedges therein, spacing means formed with an opening therein and formed to space said anchorage means from a form board to which said anchorage means is to be mounted, and assembly mounting means extending through said spacing means to said anchorage means, the improvement comprising:

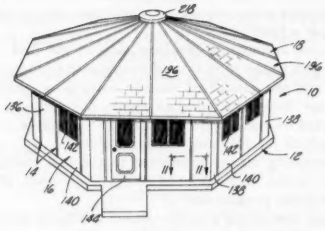
a. anchorage securement means in the form of a cylindrical surface formed in said tapered bore intermediate the ends of said bore, said surface being formed with cylindrical thread means for receipt and releasable securement of said assembly mounting means thereto, said surface being further dimensioned for spanning thereof by said tendon gripping wedges and for convergent axial movement of said tendon gripping wedges thereover upon removal of said tendon mounting means from said tapered bore; and

b. said assembly mounting means includes a tubular pipe having a threaded cylindrical inner end formed and dimensioned for and in releasable mating engagement with said cylindrical thread means formed in said surface, said assembly mounting means being further formed proximate an outer end of said pipe for releasable securement to said form board.

3,921,354
HOUSE CONSTRUCTION AND SUBASSEMBLIES THEREOF

Edward B. Connelly, 39240 Lakeshore Drive, Mount Clemens, Mich. 48043, and Reinhart Weber, Box 373, Portage Park, Midland, Ontario, Canada

Filed May 31, 1974, Ser. No. 475,125
Int. Cl.² E04H *1/00*; E04B *1/34*; E02D *27/32*
U.S. Cl. 52—237 **7 Claims**

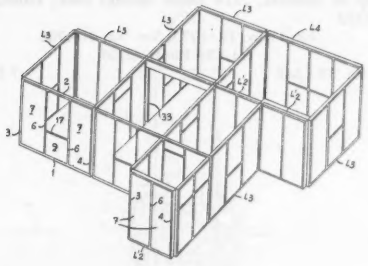


1. A house construction comprising wall structure means for enclosing the sides of the house; roof structure means for enclosing the top of the house; a foundation for the house construction and support structure means mounted on said foundation and operatively connected with said wall structure means and said roof structure means for supporting said wall and roof structure means; said support structure means including a plurality of longitudinally extending base rails, said base rails being arranged in a polygonal shape of greater than three sides with junctures of pairs of said base rails defining base corners, a plurality of vertical rails supported on and secured to a plurality of said base rails, said plurality of vertical rails being generally uniformly spaced along each of said plurality of base rails and spaced away from associated ones of said corners, adjacent vertical rails on said base rails defining uniform generally planar openings, adjacent vertical rails on adjacent base rails defining uniform angulated openings, a plurality of headers connected together and connected with the upper ends of said vertical rails and arranged to define a polygonal shape similar to that defined by said base rails with the junctures of adjacent headers defining upper corners, a vertically extending center post assembly supported on said foundation and located generally centrally with respect to said base rails and said headers, said center post assembly having a rotatable hub supported proximate the upper end of a vertical center post, said hub located at an elevation above said headers, a plurality of corner rails extending radially from said hub to each of said upper corners, an intermediate rail located between said corner rails and extending radially from said hub to said headers.

3,921,355
BUILDING COMPOSED OF PREFABRICATED ELEMENTS

Jean Pennecot, 7, Rue du Docteur Chauveau, 21 Dijon, France

Filed Apr. 9, 1974, Ser. No. 459,280
Claims priority, application France, Apr. 12, 1973, 73.13231
Int. Cl.² E04B 1/348, 1/38
U.S. Cl. 52—262 22 Claims



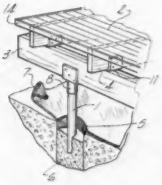
1. A building having walls and partitions which are constituted by an assembly comprising prefabricated elements and connecting means for interconnecting the prefabricated elements, each of said elements comprising a ladder-frame having uprights and cross-members, which uprights and cross-members have an identical thickness in respect of all of said elements and define wall parts, structures disposed in said wall parts and connected to said uprights and cross-members, each of said structures comprising any of the following three items: filler means and chassis and frames for windows and doors; end uprights of the uprights of each element defining an end edge surface of the element, the connection at 90° or 180° of a plurality of adjacent ones of said elements by said connecting means being along said end surfaces thereof in such manner that said end surfaces of adjacent pairs of said elements in said connection have edges adjoining each other and define two adjacent sides of a square-sectioned prismatic region, said connecting means interconnecting said elements in said region, the interconnected elements being sufficiently strong and rigid to constitute bearing walls and the connecting means being merely sufficient to perform their connecting function and insufficient to perform a load carrying function, the elements being divided in two series, a first series being formed by standard primary elements and a second series being formed by standard secondary elements, the secondary elements being shorter in plan than the primary elements by an amount equivalent to the dimension of one side of said square-sectioned region whereby to permit a combination of partitions and walls with the use of said standard primary and secondary elements.

3,921,356
SYSTEM AND APPARATUS FOR INTERCONNECTING STRUCTURAL MEMBERS, AND METHOD OF UTILIZING SAME

Robert S. Hughes, 28275 Ranchwood, Southfield, Mich. 48075

Filed June 22, 1973, Ser. No. 372,698
Int. Cl.² E04B 1/56; E04C 1/32
U.S. Cl. 52—299 3 Claims

1. An apparatus for facilitating the interconnection of a plurality of structural members comprising, in combination:
- a plurality of fastening means;
- a plurality of said structural members;
- said apparatus including at least one surface thereof which is provided with apertures to facilitate the passage therethrough of at least some of said fastening means which serve to fasten said apparatus to one or more of said structural members;
- a first element having a substantially L-shaped cross-section and including a first portion and a second portion;
- a second element having a substantially L-shaped cross-section and including a first portion and a second portion;
- adjustment means adjustably interconnecting said first and second elements to permit relative motion therebetween in order to accommodate various sizes of or numbers of said structural members therebetween;
- said first portion of said first element includes one said surface being provided with a plurality of said apertures which are aligned in a first predetermined direction;
- said first portion of said second element includes another said surface being provided with a plurality of said apertures which are aligned in a second predetermined direction which is disposed substantially perpendicular to said first predetermined direction;

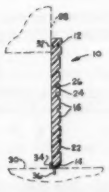


- a third element which is substantially tubular in shape and which is rotatably interconnected to and affixed to one of said second portions to permit rotational adjustment of said first and second substantially L-shaped element relative to said third tubular element; and
- said adjustment means includes
  - a plurality of slots provided in said second portion of said first substantially L-shaped element, the longitudinal axis of said slots being perpendicularly disposed to the longitudinal axis of said first substantially L-shaped element,
  - a plurality of slots provided in said second portion of said second substantially L-shaped element, said slots being substantially similar to the slot provided in said first substantially L-shaped element and disposed in a vertically collinear relationship thereto, and
  - a plurality of rivets perpendicularly disposed in said slots and abuttingly contacting said first and second substantially L-shaped elements so as to permit relative motion therebetween.

3,921,357
MOBILE HOME SKIRTING SIDE PANEL

Earl L. Unruh, 612 Pinewood Drive, San Jose, Calif. 95129

Filed Oct. 29, 1974, Ser. No. 518,345
Int. Cl.² E04C 2/20
U.S. Cl. 52—309 8 Claims



1. A skirting panel having a front surface configuration simulating a masonry facade comprising a sheet of rigid cellular plastic material having opposite side edges conformably shaped to one another to permit each to matingly interlink

with the edge of an adjacent sheet, said rigid cellular plastic material being a multitude of thermoplastic polymer beads fused together to provide said sheet and to form said surface configuration with cavity interstices simulating the surface cavitations on masonry, and a decorative coating on said front surface of said panel.

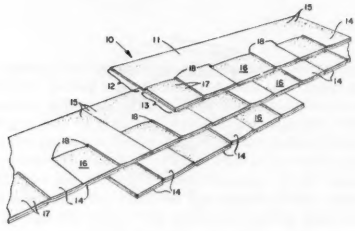
3,921,358
COMPOSITE SHINGLE

Phillip S. Bettoli, Martinville, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 882,654, Dec. 5, 1969, abandoned, which is a continuation of Ser. No. 644,296, June 7, 1967, abandoned. This application Nov. 15, 1974, Ser. No. 524,158

Int. Cl.² E04D *1/26, 1/36*

U.S. Cl. 52—314 **22 Claims**



1. A composite asphalt-impregnated felt roofing shingle comprising a rectangular sheet having a headlap portion and a butt portion, the butt portion comprising a series of tabs separated by spaces extending continuously from the headlap portion to the exposed edge of the butt portion; and an elongated rectangular strip of substantial thickness having substantially the same length as the sheet and a width substantially equal to the height of the butt portion, the strip being interwoven with successive tabs, a longitudinal marginal edge of the strip coinciding with the exposed longitudinal marginal edge of the butt portion.

3,921,359
MULTIPLE-PANE GLAZINGS

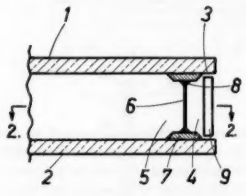
Edgard Brichard, Jumet, and Michel Lambert, Brussels, both of Belgium, assignors to Glaverbel S.A. Secretariat Technique, Brussels, Belgium

Filed Nov. 17, 1971, Ser. No. 199,652

Claims priority, application Luxemburg, Nov. 27, 1970, 62150

Int. Cl.² E04C *2/54*; E04B *2/28*

U.S. Cl. 52—616 **6 Claims**



1. In a multiple glazing composed of at least two sheets of glass and a metal ribbon positioned between and soldered to the sheets adjacent the edges thereof, to define a groove with the corresponding edges of the sheets, the improvement comprising a compression resisting spacing member disposed in said groove adjacent said ribbon, and outside the region enclosed by said ribbon, and between said two sheets of glass, said spacing member having the form of a continuous, corrugated ribbon and constituting means for absorbing pressures directed between said sheets and capable of deforming said ribbon, to thereby prevent said ribbon from being deformed when such pressures exist.

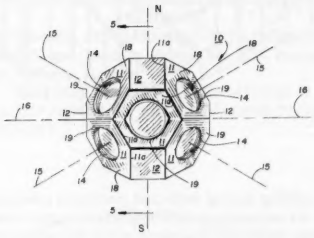
3,921,360
STRUCTURAL FRAMEWORK AND CONNECTOR THEREFOR

Philip M. Baldwin, 2514 Maple Springs Blvd., Dallas, Tex. 75235

Filed Nov. 12, 1973, Ser. No. 414,906

Int. Cl.² E04H *12/06*

U.S. Cl. 52—648 **7 Claims**



1. A structurally stable framework comprising, in combination, a plurality of elongated struts of equal length joined to one another adjacent their ends, and a plurality of connectors for so joining said struts;

each of said connectors comprising a three dimensional irregular polyhedron having a first plurality of discrete surface portions and a second plurality of discrete surface portions adjacent said first plurality, said first plurality of discrete surface portions being regular hexagons formed by adjacently disposed trapezoids inclined toward one another along a common intersection, said second plurality of discrete surface portions being squares;

respective means at said first plurality of discrete surface portions for retaining the said struts in a manner which disposes the elongated axes thereof normal to the center of said first plurality of discrete surface portions;

first axes respectively normal to the center of adjacent ones of said first plurality of discrete surface portions being disposed at 60° with respect to one another and second axes respectively normal to the center of said second plurality of discrete surface portions being disposed at 45° with respect to the immediately adjacent first axes.

3,921,361
METHOD OF PUTTING UP TALL STRUCTURES, ESPECIALLY TUBULAR LININGS IN CHIMNEYS

Nils Harald Ahlgren, Saltsjobaden, Sweden, assignor to Uddemann Byggteknik AB, Stockholm, Sweden

Filed Dec. 29, 1972, Ser. No. 319,400

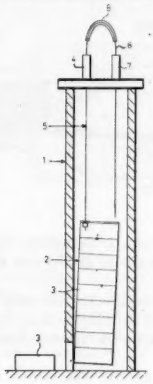
Claims priority, application United Kingdom, Dec. 30, 1971, 60840/71

Int. Cl.² E04B *1/35*; E04G *21/14*

U.S. Cl. 52—747 **1 Claim**

1. A method of erecting a composite structure of the type in which a plurality of structural elements are connected together in elevated superposed relation, which method comprises the steps of connecting one end portion of a first flexible line section to the top structural element of the composite structure; connecting a second flexible line section to said first line section at a location thereon distance from the opposite end thereof to thereby provide a free end portion of said first line section extending from the place of connection with the

second line section; pulling upward on said second line section to raise said top structural element a given distance above a reference level to accommodate emplacement of another structural element under said top structural element; connecting said other structural element to the top structural element; repeating said pulling and said connecting steps to connect together subsequent structural elements until a predetermined number of structural elements have been connected together; pulling upward on said free end portion of the first line section to support the connected together structural elements while disconnecting the second line section from the first line section; connecting an end portion of said second line section to said top structural element to share with said first line section the load of said connected together structural elements; pulling upward on both said first and second line sections to raise the connected together structural elements said given distance to accommodate emplacement of another structural element under the lowermost of said connected together structural elements; connecting said other structural elemenet to the lowermost structural element; repeating said steps of pulling both the first and second line sections and connecting other structural elements until all of the structural elements of the composite structure are connected together.



3,921,362

METHOD OF AND MEANS FOR MULTI-STORY BUILDING CONSTRUCTION

Pablo Ortego Cortina, Taine 229, Despachos 601-602, Mexico 5, D.F., Mexico

Filed July 16, 1974, Ser. No. 489,030
Claims priority, application Mexico, Mar. 18, 1974, 149914
Int. Cl.[2] E04B 1/343, 1/35
U.S. Cl. 52—745 **7 Claims**

7. The method of erecting single or multiple story concrete columnless buildings which comprises the steps of:

forming in situ a permanent first floor slab for a building to be erected, said first floor slab forming a first casting bed;

pouring a first set of load supporting, downwardly swingable wall panels in a generally horizontal position on said first casting bed and embedding portions of spaced apart flexible pick-up cables across the periphery pivot line of said first set of wall panels, said wall panels representing substantial portions of at least two pairs of walls approximately at right angles to each other;

filling any voids in or between said wall panels to provide a second casting bed;

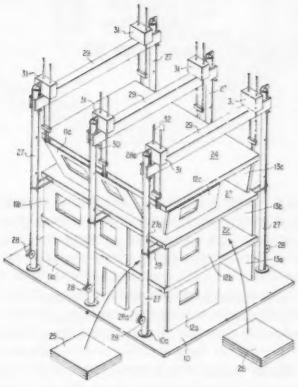
pouring a second floor slab in horizontal position on said second casting bed, completing the attachment of said first set of wall panels to said second floor slab by securing said flexible pick-up cables across said pivot line between each said wall panel and said second floor slab;

pouring alternating additional sets of wall panels and floor slabs one above the other in layers with each layer utilizing the preceding layer as a casting bed, each said set of wall panels being attached to its corresponding above floor slab to form a stack of said wall panels and floor slabs corresponding to the stories of building;

allowing the concrete to cure to acceptable strength;

securing lift attaching members to the periphery of an uppermost one of said floor slabs and to each said floor slabs in sequence;

erecting pairs of spaced columns exteriorly positioned to said first floor slab and adjacent said lift attaching members, said columns being slightly greater in height than the height of the erected building;



supporting one floor height above the poured stack a movable bridge member between each said pair of columns, each of said bridge members extending over said stack of wall panels and floor slabs and carrying lift means adjacent to each column;

attaching lift fixtures to said lift attaching members;

connecting said lift fixtures to said lift means;

actuating said lift means to raise said stack whereby each of said two pairs of wall panels at approximately right angles to each other in said first set of wall panels swing downwardly on said pick-up cable about said pivot lines to a near vertical position;

plumbing the nearly vertical walls by laterally positioning the bottoms of said walls into a load supporting laterally stable structure;

lowering said stack to support said second floor slab and said above stack on said downwardly swung plumbed walls;

disconnecting said second floor slab lift fixtures from the above lift fixtures, disengaging said lift means, and raising and securing said bridges on said columns the height of an additional story;

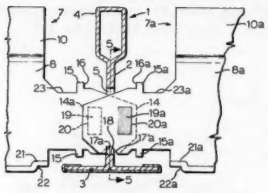
engaging said lift means with said remaining lift attaching members, and repetitively and alternately raising said stack to allow succeeding sets of wall panels to swing into near vertical position, plumbing said wall panels and securing said bridges and lift means to erect each additional story of said building; and

dismanteling and removing said bridge members and columns after said building has been erected.

3,921,363
CROSS MEMBER WITH END CONNECTOR

John O. Beynon, Waterloo, Canada, assignor to Preston Metal and Roofing Products Limited, Cambridge, Canada

Filed May 17, 1974, Ser. No. 470,994
Int. Cl.² F16B 7/00
U.S. Cl. 52—758 A 22 Claims

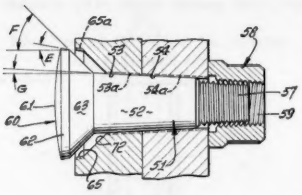


1. A cross member having a connecting means at an end thereof for interconnecting said cross member to a longitudinal main member provided with vertical slots therethrough which slots at their ends are of a width to snugly receive a pair of opposing such connecting means and which are of a greater width away from their ends to permit the opposite bowing of such connecting means, said cross member having a vertically disposed planar web; each of said connecting means comprising a generally planar tongue offset to one side and parallel to the plane of and projecting beyond the end of said web; said tongue having outstanding stop lug means formed thereon to limit slot penetration and having a barb located forwardly of said stop lug means and presenting an inclined camming surface projecting from the plane of said tongue towards the plane of said web and increasing in height away from the free end of the tongue and terminating in a locking shoulder facing away from the free end of said tongue and disposed relative to said stop lug means so that with said stop lug means in slot penetration limiting position said shoulder lies within a slot in a main member in position for inter-locking engagement with a corresponding locking shoulder on a corresponding barb of a corresponding tongue inserted into the slot from the opposite side of the main member, said tongue at least forwardly of said stop lug means being adapted to resiliently bow out of its vertical planar configuration to enable said barb to be displaced laterally relative to the top and bottom edges of the tongue outwardly away from the plane of said cross member web; the arrangement being such that when opposing tongues of corresponding cross members are inserted into a main member slot from opposite sides thereof, each tongue between its top and bottom edges is adapted to bow outwardly under mutual contact of the opposing barb camming surfaces away from the plane of the web of the respective cross member and away from the opposing tongue as permitted by the wider portion of the slot while the end portions of the slot hold the top and bottom edges of the opposing tongues in contiguous face to face relation until the tongues penetrate the slot to an extent limited by the respective stop lug means at which point the opposing tongue barbs have passed by one another permitting the respective tongues to resiliently recover from the bowing thereof whereupon they spring back towards their normal positions to bring the respective locking shoulders into facing interlocked relation to coact with the stop lug means to lock the respective tongues in the slot.

3,921,364
FASTENER WITH TAPERED SHANK AND DUAL TAPERED HEAD

Franklin S. Briles, 3600 Catamaran, Corona Del Mar, Calif. 92625

Continuation-in-part of Ser. No. 388,386, Aug. 15, 1973, Pat. No. 3,849,964. This application July 15, 1974, Ser. No. 488,562
Int. Cl.² F16B 35/06, 5/00
U.S. Cl. 52—758 F 3 Claims



1. In combination with a workpiece having a bore and counterbore, the counterbore having first and second frusto-conical extents,

a. a fastener having an axially extending shank received in said work bore and defining an axis, and a head received in forcible engagement with work material forming said counterbore,

b. the head having an end face, a first forwardly tapered frusto-conical section located forwardly of said end face and a second forwardly tapered frusto-conical section located forwardly of the first section, the axial length and taper angularity of the second section substantially exceeding the axial length and taper angularity respectively of the first section, the taper angularities being measured from said axis,

c. the shank tapered forwardly along its work bore engaging extent, the bore also being forwardly tapered,

d. the shank having annular interference engagement with the bore at one axial location to produce a counterclockwise moment in the work, the head first tapered section also having annular interference engagement with the counterbore first frusto-conical extent at another axial location to produce a counterbalancing clockwise moment in the work, said interferences being predetermined and said locations being axially spaced to minimize warpage of the work.

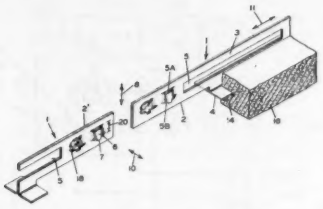
3,921,365
JOINT STRUCTURE FOR SUSPENDED CEILING SYSTEM MEMBER

Ernest B. Nute, Jr., Mountville; Paul H. Jones, Willow Grove, and Frank J. Vasaturo, Holmes, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 4, 1974, Ser. No. 512,168
Int. Cl.² F16B 7/04
U.S. Cl. 52—758 A 3 Claims

1. In a suspended ceiling system including a plurality of members which are utilized to suspend ceiling panels in position, comprising: at least two cross members placed in an end-to-end relationship, each of said cross members having an extension projecting outwardly from the cross member, the main body of the cross member being composed of a vertical rib and a horizontal flange and the extension extends outwardly from the vertical rib, each extension on each cross member having a uniform width elongated slot structure therein and two bent-out protrusions extending on opposite sides of the plane of the extension, said two extension members being placed in a side-by-side relationship, and when the two extension members are in a side-by-side relationship, at least one protrusion of one extension member being inserted

into the slot of the adjacent extension member whereby the cross member structures are capable of adjustment along the longitudinal axis of the cross members and will be able to restrain separation against a force applied either in the direction in a line perpendicular to the horizontal flange or in the plane of the extension members, ceiling panel structures are positioned on the horizontal flange and are located on either side of the two mating extension members of two adjacent



cross members, the improvement comprising a dimple being positioned on only one side of the protrusion and spaced from the plane of the extension a distance equal to approximately the thickness of the extension, said dimple projecting below the bottom surface of the protrusion and engages the edge of the slot of the adjacent extension to positively lock together the extension member containing the protrusion and the extension member containing the slot.

3,921,366

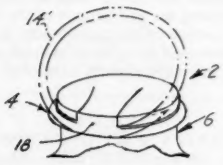
METHOD OF MAKING AND APPLYING A TEAR-OFF CAP CLOSURE

Jack A. Coop, 141 N. 24th St., New Castle, Ind. 47362

Division of Ser. No. 390,095, Aug. 20, 1973, Pat. No. 3,865,268. This application Dec. 17, 1974, Ser. No. 533,612

Int. Cl.² B65B *61/18*; B67B *3/02*; B65B *7/28*

U.S. Cl. 53—15 **14 Claims**



1. A method of securing a tear-off cap closure on a container which is open at the top and has a finish adjacent the opening comprising,

forming a cap body with a cap top and a skirted cap wall and with a peripheral bead at the terminal edge of the cap wall,

placing the cap body over the top of the container,

deforming the skirted cap wall inwardly against the finish of the container,

simultaneously forming a pull-ring by severing a portion of the bead from the cap body while leaving another portion intact to form a bridge portion.

3,921,367

PROCESS FOR CONDITIONING LIQUID

Francis Beaurain, Route Nationale, Boubert S/Canche, 62 270 Frevent, France

Filed Oct. 11, 1973, Ser. No. 405,424

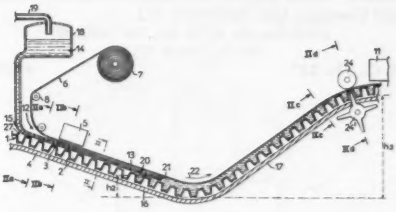
Int. Cl. B65b *3/02*, *3/06*

U.S. Cl. 53—37 **13 Claims**

1. A method of rapidly producing sealed packages of a liquid-based product in a condition which prevents air from contacting the product in the sealed packages, comprising:

providing an elongate, longitudinally movable band of open-top receptacles and an overlying elongate, longitudinally movable cover sheet for the same with first and second longitudinal edges of the cover sheet overlying, respectively, first and second longitudinal edges of the band of receptacles, and with transverse edges of the receptacles extending from the first to the second edges of the band;

continuously sealing the first and second longitudinal edges of the band to the respective, overlying edges of the cover sheet to provide a sealed, elongate tunnel comprising the cover sheet and the band, while keeping a transversal aperture of the tunnel open at one end thereof;



keeping a portion of the tunnel, including the receptacles in said portion, filled with a sterile, liquid-base product up to a predetermined liquid level in the tunnel by introducing such product through said aperture into the tunnel below said liquid level;

continuously rapidly longitudinally raising the sealed tunnel to a zone above said liquid level to produce a lowered pressure in the tunnel and in the filled receptacles therein; and

closing the filled receptacles in the raised tunnel by sealing the cover sheet to their transversal edges;

whereby sealed packages of said product, each corresponding to one of the filled receptacles, are rapidly produced in a condition which prevents air from cor tacting the product in the packages.

3,921,368

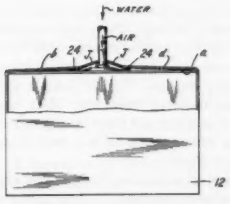
METHOD OF ADHESION OF SURFACES ESPECIALLY AS APPLIED TO CORRUGATED PAPER BOARDS

James A. Hanley, 377 Virginia Ave., Jersey City, N.J. 07304

Continuation-in-part of Ser. No. 337,946, March 5, 1973, abandoned. This application Apr. 29, 1974, Ser. No. 464,938

Int. Cl.² B31B *1/26*

U.S. Cl. 53—47 **2 Claims**



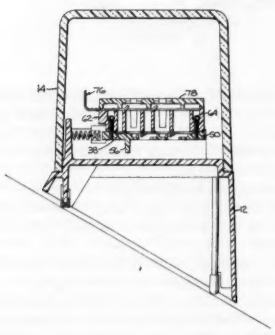
1. A method of securing the flaps of a conventional shipping case having a front flap, a back flap, and two side flaps each flap having an inner surface which faces into the case when the case is closed and an outer surface which faces outward of the case when the case is closed, comprising:

a. Folding the front and back flaps inward over the case;
b. Applying a layer of glue to the center area of the inner face of each side flap leaving an unglued strip along the unattached edge of each side flap;
c. Folding the side flaps inward over the front and back flaps over the case;
d. Squirting a thin layer of cold water between the edges of the flaps along the junction of the unglued strips of the side flaps with the upper faces of the front and back flaps;
e. Freezing the layer of water to ice; and
f. Removing the ice by melting the ice and evaporating the water at room temperature.

3,921,369
SENSITIVITY DISK DISPENSER

Thomas B. Adams, Ruxton, Md., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Jan. 10, 1975, Ser. No. 540,100
Int. Cl.² B65B *5/08*
U.S. Cl. 53—237 **9 Claims**



1. A device for dispensing a sensitivity disk from a cartridge roll to a receptacle provided with a predetermined area for receiving the disk, said device comprising:

a housing;

surfaces on said housing defining a base for receiving said receptacle;

a first plate disposed within said housing parallel to and spaced apart from said base, an opening in said plate, said opening being offset from said receptacle area when said receptacle is positioned on said base in a first position and aligned with said area when said receptacle is positioned on said base in a second position and wiper means affixed to said plate extending into said opening;

a second plate disposed for movement within said housing interposed between said first plate and said base, an opening in said second plate in alignment with said receptacle area when a receptacle is positioned on said base in said first position;

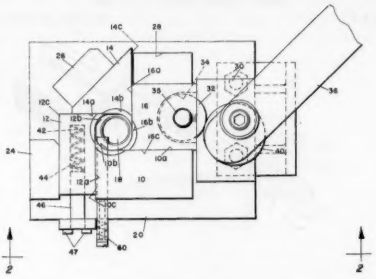
means affixed to said second plate for engagement with a portion of said receptacle when said receptacle is positioned on said base in said first position whereby when said receptacle is shifted to said second position, said second plate moves with said receptacle; and,

a third plate affixed to said second plate for movement therewith, said third plate including a tubular opening therein in alignment with said first plate opening for supporting a cartridge roll.

3,921,370
CORK COMPRESSOR MECHANISM

Robert W. Vergobbi, Braintree, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Aug. 12, 1974, Ser. No. 496,621
Int. Cl.² B27B *1/04;* **B30B** *7/04;* **B27J** *5/00*
U.S. Cl. 53—326 **9 Claims**



1. A device comprising a fixed block having right angularly disposed side and end surfaces, a movable block having a right angularly disposed side and end surfaces arranged with the side surface in sliding engagement to the end surface of the first fixed block for movement of its side surface perpendicular to the side surface of the fixed block, a second movable block having right angularly disposed side and end surfaces supported with its side surface in sliding engagement with the end surface of the first block for movement of its side surface parallel to the end surface of the first block and perpendicular to said end surface and a third movable block having right angularly disposed side and end surfaces disposed with its side surface in sliding engagement with the end surface of the second block for movement perpendicular to said end surface and with its end surface in sliding engagement with the side surface of the first block for movement parallel thereto, and means for effecting movement of the third block along the fixed block towards the second block to cause said second block to move along the end surface of the first block and along the side surface of the third block, and said second block by said movement along the third block moving the first block along the end surface of the fixed block.

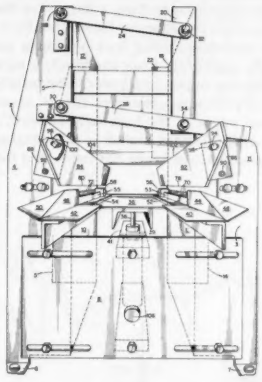
3,921,371
CARTON SEALING MACHINE

Richard G. Lee, 780 Boylston St., Boston, Mass. 02199

Filed Apr. 3, 1974, Ser. No. 457,571
Int. Cl.² B65B *51/02*
U.S. Cl. 53—387 **12 Claims**

1. Means for sealing together the upper and lower end flaps of a carton comprising means for temporarily holding said lower flaps in vertical position and other means for holding said upper flaps in extended position, means for creating an adhesive condition on the under sides of said upper end flaps while the said upper flaps are disposed in said temporary extended condition, opposed pressure plates of which at least one is pivoted on a substantially horizontal axis, the lower edges of said plates comprising the other means for holding said upper flaps in extended position and fixed against upward pivoting movement, said plates also acting to subsequently press said upper flaps against the said lower flaps at the ends of said carton, means for limiting the movement of each pivoted plate toward the other plate, a pair of parallel walls above said plates spaced apart a distance substantially equal to the length of said carton, the distance between the upper edges of said plates being less than the distance between said walls and less than the length of said carton, and an elevator movable vertically between said plates for moving a carton that has been placed on said elevator upward between and past said

plates to a position between said walls, the upward movement of said carton causing movement of each said pivoted plate away from the other plate to allow said carton to pass while



all the time pressing said upper flaps against said lower flaps, said plates returnable to their original positions to act as means for preventing subsequent downward movement of a carton there above between said walls.

3,921,372

GRASS-CUTTING DEVICE

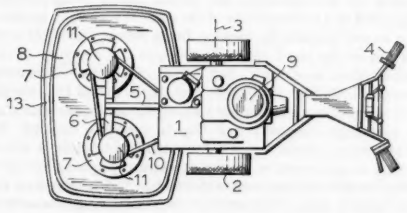
Lennart Oswald Arnblock, Vellinge, Sweden, assignor to Flymo Societe Anonyme, Zug, Switzerland

Filed Mar. 14, 1974, Ser. No. 451,110

Claims priority, application United Kingdom, Mar. 27, 1973, 14595/73

Int. Cl.² A01D *53/00*

U.S. Cl. 56—12.8 **1 Claim**



1. A grass cutting device having a self-propelled drive unit with a cutter unit having means including a housing operating to support the cutter unit off the ground by an air cushion comprising in combination, cutter mounting means connecting said cutter unit to said drive unit comprising drive means coupled between said two units for powering the cutter from said drive unit and first tilting means including a horizontally extending connecting shaft structure disposed above the cutter unit and journalled to permit rotation of said cutter to a limited extent about the shaft axis thereby allowing tilting of the cutter unit around a substantially horizontally-extending first axis, and mounting means coupling said cutter unit housing to said shaft including a substantially horizontally extending beam carried by said shaft disposed above the housing substantially perpendicular to said shaft and brackets connecting said beam to said cutting unit to swing relative to said beam around an axis perpendicular to that of said shaft thereby comprising further structure allowing tilting of the cutter unit around a substantially horizontally-extending second axis perpendicular to the first axis said cutter mounting means being disposed to permit said housing to ride on the ground supported therefrom by said air cushion and having a continuous freedom of movement over a limited degree of rotation about said two axes to conform with irregularities of ground surface.

3,921,373

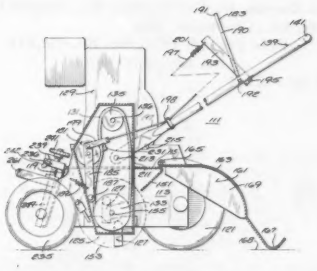
POWER RAKE

Robert M. Rubin, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 13, 1974, Ser. No. 505,559

Int. Cl.² A01D *51/00*

U.S. Cl. 56—16.6 **10 Claims**



1. A power rake comprising a housing including a top wall, spaced side walls, and means supporting said housing for travel over the ground, a thatching reel including a plurality of thatching blades, means supporting said thatching reel in said housing for rotation of said blades in respective vertical paths, means for rotating said reel so that, adjacent to the ground, said blades travel in the direction opposite to the intended direction of travel, and baffle means extending downwardly and forwardly between said side walls from behind said reel and terminating adjacent to the periphery of the path of said blades for substantially reducing accumulation within said housing of thatch cut by said blades and discharged therefrom.

3,921,374

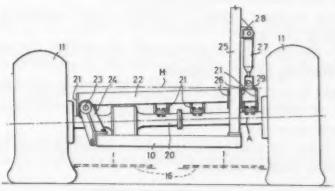
TILT CORRECTING DEVICE FOR A SUGAR CANE HARVESTER

Laurence Mizzi, P.O. Box 144, Ingham, Queensland 4850, Australia

Filed Dec. 6, 1973, Ser. No. 422,366

Int. Cl.² A01D *67/00*

U.S. Cl. 56—208 **1 Claim**



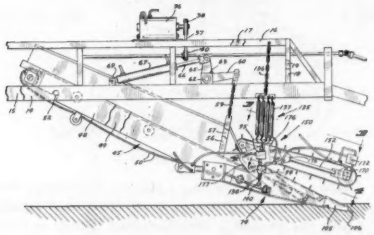
1. A sugar cane harvester of the type having a main frame on a pair of rear drive wheels and a pair of front wheels, a base cutter assembly mounted vertically adjustably at the front of the main frame and adapted to cut cane as the harvester advances, and an elevator mounted on the rear of the main frame oscillatably about a vertical axis and adapted to elevate and discharge harvested cane to one side or the other of the rear of the main frame; wherein the rear wheels of the main frame are mounted on a common axle located above said main frame and secured to and below a rear axle mount, said rear

axle mount being pivotally attached at one end to a longitudinally extending pivot pin carried by brackets secured to and extending upwardly from said main frame, with the other end of said mount being vertically movably guided between standards secured to and extending upwardly from that side of the main frame, and a hydraulic cylinder connected operatively between the main frame and said axle to raise or lower one side of the main frame relative to the corresponding side of said axle.

3,921,375
TOMATO HARVESTING HEADER ATTACHMENT FOR POTATO COMBINE

Frank A. Cetrulo, Jr., Fort Thomas, Ky., assignor to National Factors, Inc., Cincinnati, Ohio

Filed Feb. 25, 1974, Ser. No. 445,213
Int. Cl.² A01D *46/00*
U.S. Cl. 56—327 R **1 Claim**



1. A tomato harvesting header attachment for a potato combine, having in combination

a frame member comprising a potato combine,

an elevating conveyor carried by said combine,

a tomato pickup conveyor extending forwardly of said elevating conveyor in operative relationship thereto and comprising spaced upstanding resilient fingers,

tomato-vine cutting means carried by said pickup conveyor forwardly thereof,

an elevated conveyor comprising spaced upstanding resilient fingers spaced above said tomato pickup conveyor and having its lower run extending the length of and moving in the direction of the upper run of said tomato pickup conveyor spaced therebelow and cooperating therewith to engage and elevate tomato vines therebetween,

means supporting said elevated conveyor in spaced relation to said tomato pickup conveyor,

power means carried by said combine operating said elevated conveyor,

said conveyor supporting means comprising a pair of slotted overlying plate members,

means adjustably securing said plate members together,

one of said plate members being carried by said elevated conveyor, and

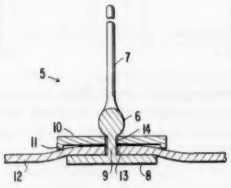
the other of said plate members being carried by said tomato pickup conveyor.

3,921,376
SNAP-ON TINE TOOTH

Walter David Hofer, Box 580, Pincher Creek, Canada

Filed July 29, 1974, Ser. No. 492,540
Int. Cl.² A01D *77/00*
U.S. Cl. 56—400 **3 Claims**

1. A combine detachable tine tooth device comprising in combination: a combine tooth having a central shaft and having a transversely laterally extending integral base flange extending in each of opposite directions away from the shaft, the central shaft extending axially and being shaped (a) to include a bend at a first location intermediate of the shaft's axial length, the bend being spaced a first predetermined distance from the base flange, and (b) to include at a second location intermediate between the base flange and the bend, a locking flange means for locking a flange-key therebeneath against a belt located on an upper face of the base flange, the locking flange means including locking flange structure extending laterally outwardly from the shaft; a separate base-strip element having upper and lower substantially flat faces with downwardly directed pressure flange at substantially outer peripheral edges of the base-strip element's lower flat face, the base-strip element including a throughspace about centrally of the upper and lower flat faces, and the base-strip



element having a first flap extending toward and partially defining the through-space, the through-space being substantially equal to a cross-section of the shaft at a point in juxtaposition to and beneath the locking flange means, such that upon insertion of the shaft upwardly through the aperture of the combine-tooth-mounting belt and thereafter upwardly through the through-space, the first flap is flexed backwardly by virtue of of pressure of the locking flange means such that the base-strip element's first flap is snapable beneath the locking flange means into a detachable locked state in which the base strip element is pinned downwardly against an upper surface of the combine belt with the belt locked between the base flange's upper face and a lower face of the base strip element.

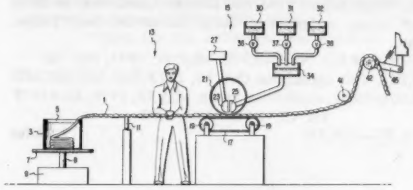
3,921,377
PRODUCTION OF DYED FABRICS

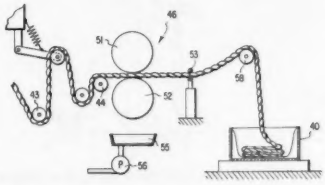
Michael E. Snyder, Albermarle, N.C., assignor to E. J. Snyder & Co., Inc., Albemarle, N.C.

Filed Oct. 26, 1973, Ser. No. 409,885
Int. Cl.² D06B *3/24, 11/00*
U.S. Cl. 57—35 **9 Claims**

5. In apparatus for continuously dyeing a length of fabric, which apparatus includes a dye station through which the fabric passes while travelling in the direction of its length and in which the fabric is brought into contact with a quick-setting dye in such a manner as to cause the dye to impregnate the fabric, the improvement comprising: means disposed ahead of said dye station and mounted for rotation for imparting a longitudinal twist to the fabric to cause the fabric to pass through the station in a twisted state for causing the dye to non-uniformly color the fabric with a generally longitudinal,

randomly varying pattern effect; drive means connected to rotate said means for imparting a twist; and storage means for storing the fabric in its longitudinally twisted state after it has passed through said dye station.





3,921,378
CABLE COMPONENT SCREENING

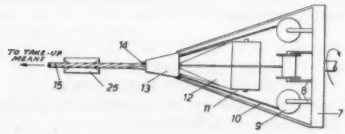
Lyndon R. Spicer, Llandevaud, Wales, and Christopher Robert Carter, London, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 14, 1972, Ser. No. 234,559

Claims priority, application United Kingdom, Mar. 23, 1971, 7544/71

Int. Cl.³ H01B *13/02, 13/26*

U.S. Cl. 57—59 **6 Claims**



1. A method of screening each of a plurality of electric cable components from one another and laying up the screened cable components, so formed, into a cable in one continuous operation, comprising the steps of feeding a plurality of individual cable components and an electrically conducting screening material along a longitudinal path, forming a plurality of radial convolutions in said material, guiding said cable components into said convolutions, simultaneously screening the individual cable components from one another by longitudinally applying said material to each individual cable component at the same time, and laying up the plurality of screened cable components.

5. Apparatus for simultaneously screening each of a plurality of electric cable components from one another with longitudinally applied electrically conducting material and laying up the plurality of screened cable components, so formed, in one continuous operation comprising a rotatable frame, a plurality of cable component supply reels carried on said frame, a supply reel of electrically conducting material, all of said supply reels being freely rotatable about their own axes, means for forming a plurality of radial convolutions in said material, means for guiding the cable components into the convolutions, each convolution being adapted to accommodate a respective cable component, and take-up means for pulling the cable components through said forming means to wrap said material about said cable components.

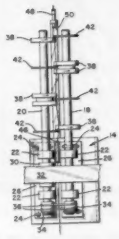
3,921,379
METHOD AND APPARATUS FOR FALSE TWISTING YARN

Joseph F. Smith, 1901 E. Wendover Ave., Greensboro, N.C. 27405

Filed May 22, 1974, Ser. No. 472,101

Int. Cl.² D02G *1/08*

U.S. Cl. 57—77.4 **13 Claims**



6. Apparatus for imparting a false twist to a continuously traveling yarn comprising; support means, a pair of parallel shafts mounted for rotation upon said support means, a plurality of axially spaced members mounted upon each shaft for rotation, each member having a cylindrical, peripheral yarn engaging surface guidably supporting a yarn rectilinearly, each member on one shaft cooperating in partial overlapping relation with a member on the other shaft to define yarn-receiving seats on opposite sides of a plane passing through the axes of said shafts, means for guiding the yarn prior to and upon emerging from said plurality of axially spaced members, said yarn guiding means having yarn guide surfaces aligned within the plane passing through the axes of said shafts, said guide means directing the yarn across the yarn engaging surfaces of selected members at an angle with respect to the direction of rotation and the axis of rotation of said selected members, each pair of cooperating members defining yarn seats being spaced apart sufficiently to permit the running yarn to alternate between yarn seats at opposite sides of the plane passing through the axes of said shafts, and means for rotating said members to impart twist to the yarn.

3,921,380
CRIMPED CONTINUOUS FILAMENT YARN AND METHOD

Alexander L. Trieunovic, Wilmington, Del.; William H. Hills, Melbourne; Milton H. Borgman, Satellite Beach, both of Fla., and Emory P. Mersereau, Wilmington, Del., assignors to Indian Head Inc., New York, N.Y.

Filed May 31, 1974, Ser. No. 475,123

Int. Cl.³ D02G *1/12*

U.S. Cl. 57—140 R **9 Claims**

1. A method of texturing continuous filament yarn comprising:

feeding said yarn into a confined crimping zone against a core of crimped yarn therein causing said yarn to collapse longitudinally and fold over forming crimped yarn which then becomes part of the said core of crimped yarn,

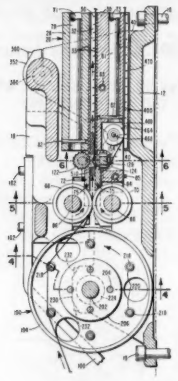
applying pressure to said crimped yarn core in said crimping zone to deform the yarn and partially set said crimps,

feeding said crimped yarn core at a uniform rate from said crimping zone to a setting zone,

transporting said crimped yarn core through said setting zone at said uniform rate,

applying heat and pressure to said crimped yarn core in said setting zone to fully set said crimps, the pressure applied

to said crimped yarn core in said setting zone being substantially only sufficient to keep said crimps closed,



cooling said crimped yarn core in a cooling zone in the absence of the application of a substantial force thereto, and

withdrawing said yarn in continuous filament form from said cooling zone.

3,921,381

METHOD OF MANUFACTURING A CABLE USING SZ TWISTING DEVICES

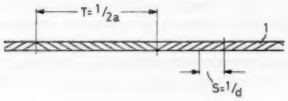
Dieter Vogelsberg, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 15, 1973, Ser. No. 341,773

Claims priority, application Germany, Mar. 17, 1972, 2213693

Int. Cl.² D07B *3/00*

U.S. Cl. 57—156 **8 Claims**



1. A method of manufacturing a communication cable so as to minimize coupling between cable units making up a finished cable, in which a plurality of SZ-twisting devices each having intermediate accumulators which reverse the twist direction at intervals of $T = 1/2a$ are used to twist insulated conductors to a plurality of cable units such as pairs or quads which are then twisted to form a cable group or a finished cable comprising:

a. operating the plurality of SZ-twisting devices with one of different pulling off speeds, speeds of rotation and storage contents, to result in a plurality of cable units in which one of the sum and difference between the twist d and number of reversals per unit length, a, of each unit differs from that of at least one other unit in the cable group of the finished cable by less than 10 percent; and

b. continuously varying one of the speed of rotation of the twisting device, pulling off speed, storage content and rate of change of storage content in an alternatively increased and decreasing manner about a mean value so that the quantities $d+a$ and $d-a$ are continuously and alternatively increased and decreased at least 0.5 percent about a mean value.

3,921,382

METHOD OF MAKING A COVERED ELASTIC YARN

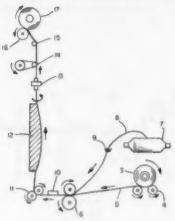
Yasuo Tsujita; Toshihiko Kimura, both of Otsu; Shigeji Yamashita, Shiga; Kazuo Yuki, and Hiroshi Asami, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 143,940, May 17, 1971, Pat. No. 3,807,162. This application Oct. 10, 1973, Ser. No. 405,167

Claims priority, application Japan, May 18, 1970, 45-41579

Int. Cl.² D02G *1/02, 3/32*

U.S. Cl. 57—157 TS **1 Claim**



1. Method for producing a covered elastic yarn comprising

1. arranging a plurality of thermoplastic heat-settable substantially inelastic filaments in the form of a running bundle,

2. applying tension to an elastic thread and continuously feeding and merging it with said thermoplastic filaments while maintaining said substantially inelastic filaments under a lower tension than that of said elastic thread, and positioning said elastic thread substantially in the center of said running bundle while maintaining said substantially inelastic filaments under a lower tension than that of said elastic thread,

3. twisting, heat-setting and detwisting the merged elastic thread and substantially inelastic filaments, said heating step being carried out at a temperature which is above the heat setting temperature of said inelastic filaments and which is sufficient to set the twist in said filaments substantially completely.

3,921,383

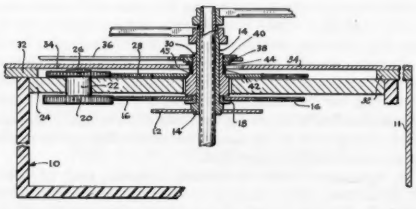
MECHANISM FOR TIDE CLOCK

Anselm James Leone, Quincy, Mass., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Oct. 10, 1973, Ser. No. 405,133

Int. Cl.² G04B *19/26, 19/00*

U.S. Cl. 58—3 **9 Claims**

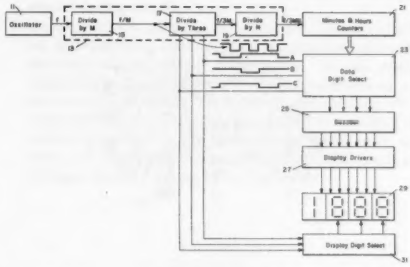


1. A timepiece utilizing a clockwork fit-up having a 12-hour tube, and including a first gear wheel fixed to said tube, a second gear wheel rotatably carried on said tube, a pair of pinions corotatably mounted and each respectively engaging one of said wheels, the rotation rate of said second wheel being substantially 0.9663 times that of said tube, an indicator corotating with said second wheel, and a dial bearing indicia for one complete tide cycle, whereon said indicator denotes the tide stage.

3,921,384
DIGITAL WATCH HAVING DUAL PURPOSE RING COUNTER

Norman E. Moyer, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 23, 1974, Ser. No. 435,914
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R 6 Claims



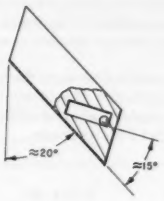
1. In a digital watch the combination of:
a. means for generating timing signals;
b. a chain of binary dividers for reducing the frequency of said timing signals to no lower than one cycle per minute, said chain including a divide-by-three counter generating three differently phased timing signal trains, said divide-by-three counter including three cascaded single-stage shift registers and logic gating means for limiting the possible combination of their states to three;
c. a display including three multi-segment digits, each for displaying a different unit of time;
d. digital means for deriving from said one cycle per minute signal a separate binarily coded signal set to represent each of said units of time; and
e. means controlled by said timing signal trains for energizing in turn each of said three display digits with a decoded translation of the binarily coded signal set representing the unit of time assigned to that digit, said means for energizing including
1. a single decoder for signalling different number-representative segment-combinations in all of said digits in response to binarily coded signals representing different numbers,
2. data digit select means controlled by said timing signal trains for individually applying binarily coded signals representing different units of time in cyclic succession from said digital means to said decoder, and
3. display digit select means controlled by said timing signal trains for individually enabling in cyclic succession respective ones of said digits to be actuated in response to being signalled by said decoding means.

3,921,385
WATCH HAVING POSITIONED CONTROLLED DISPLAY ACTUATOR WITH DELAY

Wayne M. Harding, Richardson; Neal M. Williams, and Andrew D. LeCocq, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 19, 1974, Ser. No. 452,762
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R 10 Claims

1. An electronic watch comprising:
a. a watch housing including a window;
b. electro-optical display means within said housing for visually displaying time through said window in accordance with coded time indicative signals applied thereto;
c. an electronic timekeeping circuit having display enable means, said timekeeping circuit being mounted within said housing and coupled to said display means for generating said coded signals to energize said display means in response to enable signals applied to said enable means;
d. position actuated switch means selectively positioned within said watch housing for generating actuating signals when said watch housing is oriented in a predetermined position; and

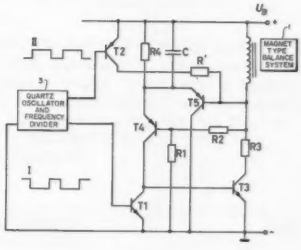


e. delay means coupling said switch means to said enable means and responsive to said actuating signal for selectively applying enable signals to said enable means in response to said watch housing being in said predetermined position to actuate said switch means at both the beginning and end of a predetermined delay period.

3,921,386
CIRCUIT FOR SYNCHRONIZING WATCHES DRIVEN BY A COIL-MAGNET SYSTEM

Hans Keller, Gundelfingen, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,157
Claims priority, application Germany, Feb. 24, 1973, 2309291
Int. Cl.² G04C *3/04*; H03B *5/30*
U.S. Cl. 58—28 R 1 Claim



1. A circuit for synchronizing watches driven by a coil-magnet system, by means of a synchronizing signal having a frequency which corresponds to the frequency of the divider output of a quartz oscillator, said circuit powered by a source of supply voltage having positive and negative poles, comprising:
a source of a first synchronizing signal;
a source of a second synchronizing signal;
a drive coil having first and second terminals, said first terminal coupled to said positive pole;
a first transistor having base, emitter and collector terminals, said base coupled to said first synchronizing signal and said emitter coupled to said negative pole of the circuit;
a second transistor having a base, emitter and collector, said base coupled to said second synchronizing signal and said emitter coupled to said positive pole;
a third transistor having a base, emitter and collector, the emitter of said third transistor coupled to said negative pole of the circuit and the base of said third transistor coupled to the collector of said first transistor;

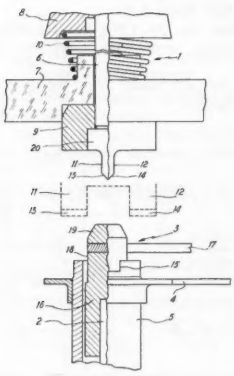
a fourth transistor having a base, emitter and collector, said collector coupled to the collector of said first transistor;
a voltage divider coupled between the collector of said third transistor and said negative pole of the circuit, the base of said fourth transistor coupled to a junction point of said voltage divider,
a fifth transistor having a base, emitter and collector, said base coupled to the second terminal of said driving coil, said emitter coupled to the emitter of said fourth transistor and said collector coupled to said negative pole of the circuit;
a first resistor coupled between the base of said fifth transistor and the collector of said second transistor; and
a capacitor coupled between said positive pole and the emitter of said fifth transistor.

3,921,387

TIME-PIECE WITH TIME-SETTING ADJUSTMENT

Pierre Barbier, Paris, France, assignor to Jaeger, Levallois-Perret, France

Filed Oct. 29, 1974, Ser. No. 518,601
Claims priority, application France, Oct. 29, 1973, 73.38474
Int. Cl.² G04B *27/00*
U.S. Cl. 58—85.5 **3 Claims**



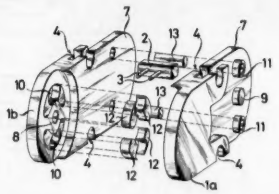
1. A time-piece comprising in combination
a. a dial
b. a wire-like second hand having one end thereof mounted in a post which is fixed to a second hand shaft, the upper end of said post adjacent said dial being bevelled,
c. a minute hand mounted on a sleeve, said sleeve and said second hand shaft being coaxially mounted with respect to one another, with said sleeve enveloping said shaft, said sleeve being formed with at least two diametrically opposed notches in the end thereof adjacent said dial, and
d. a rotatable and axially moveable actuator shaft carrying a pair of diametrically spaced feet at the bottom thereof and arranged to engage said notches when said actuator shaft is axially moved toward said dial, a radially extending sharp ridge being formed on the free end of each of said feet, said feet being spaced a distance slightly greater than the diameter of the said post, whereby said post forms a centering means for said actuator shaft when said shaft is moved toward said dial for adjusting said minute hand.

3,921,388

DRAG CHAIN

Kurt Loos, Netphen-Dreis-Tiefenbach, and Werner Moritz, Siegen, both of Germany, assignors to Kabelschlepp Gesellschaft mit beschrankter Haftung, Siegen, Germany

Filed Dec. 4, 1974, Ser. No. 529,267
Claims priority, application Germany, Dec. 4, 1973, 2360227
Int. Cl.² F16G *13/16*
U.S. Cl. 59—78.1 **9 Claims**



1. A drag chain for feeding energy conveying means from a fixed connection to a movable consumer, which includes: a plurality of chain links pivotally connected to each other, each of said chain links comprising two link discs abutting each other along a first end portion and spaced from each other at the oppositely located second end portion so as to define a slot open in the direction away from said first end portion for receiving a first end portion of another chain link, one of said end portions of each chain link being provided with transverse axially aligned pivot means and with two abutment pin means respectively arranged on diametrically opposite sides of said pivot means in equally spaced relationship thereto, the other one of said end portions being provided with axially aligned bores for receiving the axially aligned pivot means of another chain link, said last mentioned end portion of said link also being provided with two pairs of oblong recesses respectively associated with the two link discs pertaining to said link, insert means exchangeably insertable into said two pairs of recesses for varying the free space in said oblong recesses, the abutment pin means of said other chain link movably engaging the other free space of said oblong recesses of the chain link cooperating with said other chain link, each of said link discs of one and the same chain link having oppositely located longitudinal edges with undercut cutouts respectively cut open toward the respective adjacent disc edge along a chord formed by an extension of the respective adjacent edge of the respective chain link, and connecting bolt means having a flattened cross section with oppositely located rounded narrow sides and transverse thereto with oppositely located flat sides, said connecting bolts being insertable into the respective undercut cutouts and being operable by turning about the longitudinal axis thereof to be clamped in said cutouts.

3,921,389

METHOD AND APPARATUS FOR COMBUSTION WITH THE ADDITION OF WATER

Katsuyuki Kawaguchi, Akashi, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1973, Ser. No. 403,057
Claims priority, application Japan, Oct. 9, 1972, 47-100645; Oct. 9, 1972, 47-100646
Int. Cl.² F02C *3/20, 7/22*
U.S. Cl. 60—39.05 **5 Claims**

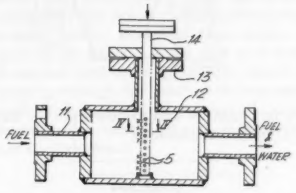
1. Apparatus for burning fuel, comprising:
a. an elongated combustion chamber; including means for mixing hydrocarbon and water, comprising
b. means for injecting a hydrocarbon fuel mixed with 5 to 10 percent water into the combustion chamber as a spray at one end thereof,;

c. means for admitting air to the combustion chamber concentrically with and from upstream of the fuel/water spray, for supporting combustion thereof;

d. means for admitting additional combustion supporting air to the combustion chamber from downstream of the fuel/water spray, for travel radially inwardly and upstream to support combustion;

e. means for admitting air to the combustion chamber downstream from where the fuel/water mixture is being combusted, for cooling and diluting the hot gases generated during combustion;

f. the combustion chamber including wall means defining an intermediate zone of the combustion chamber, between where, during combustion, the gas stream temperature is below 1500°, but combustion is still occurring, and where the cooling and diluting air is admitted by means (e), said wall means foreclosing the admission of air to the combustion chamber in said zone, for decreasing the concentration of the oxides of nitrogen in the exhaust gas stream, and



g. outlet means for exhausting the gas stream from the combustion chamber downstream from where air is admitted by means (e).

a fuel supply tube incorporating an enlarged mixing chamber;

a water injector tube place crosswise of the fuel supply tube within the mixing chamber, and including a plurality of openings sized and spaced along the length of the water injector tube to provide uniformity of amount of injection of water from each of openings, the water injector tube including means for supplying water through one end thereof;

the fuel supply tube, where the mixing chamber is incorporated, extending horizontally;

the water injector tube extending vertically within the mixing chamber;

the supplying means supplying the water injector tube through the upper end thereof; and

the cross-sectional areas of the openings of the water injector tube progressively decreasing proceeding down the water injector tube.

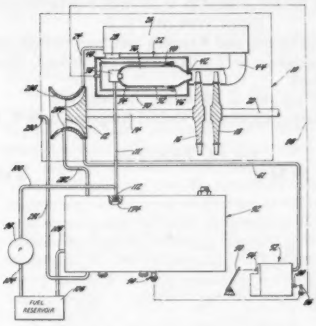
3,921,390

FUEL CONTROLLER FOR GAS TURBINE ENGINE

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1974, Ser. No. 506,100
Int. Cl.[2] F02C *7/10, 7/18, 9/10, 9/14*
U.S. Cl. 60—39.27 **4 Claims**

3. An air fuel control system for a gas turbine engine comprising: an air compressor having an inlet and an outlet, a first shaft connected to said compressor, a first turbine connected to said shaft, a turbine burner having a primary air port thereto and a secondary air port thereto, valve means for directing the compressor discharge air in a controlled ratio between said primary and secondary air ports of said burner, means for directing combustion products from said burner across said first turbine, a second turbine, a power shaft connected to said second turbine, means for driving said second turbine by exhaust gases from said first turbine, throttle control means coupled to said valve means, a fuel supply system including a single variable orifice means therein, means coupling said throttle control means to said single variable orifice means to increase the supply of fuel to the burner when a greater percentage of the discharge air from the compressor is directed to the primary port of said burner, means including a fuel pump having an inlet and an outlet for producing a fuel flow across said single variable orifice means, a regulator valve for bypassing excess fuel from the inlet of the fuel pump to the outlet thereof, said regulator valve including means responsive



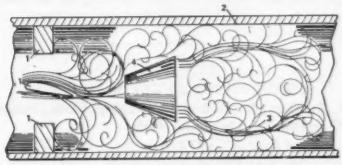
to the pressure differential across the single variable orifice means to control bypass flow and means responsive to the velocity head of air flow into the compressor to decrease bypass flow produced by pressure differential across said orifice means to control fuel flow to the burner in accordance with the mass flow of air to the burner, and means for sensing inlet air temperature to the burner for modulating the throttle controlled position of said variable orifice means to further regulate fuel flow thereacross to maintain a preselected temperature within the primary combustion zone of the burner.

3,921,391

COMBUSTOR WING VORTEX GENERATORS

Patrick H. Hall, and David W. Oliver, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 13, 1972, Ser. No. 243,720
Int. Cl.[2] F02K *7/10;* **F02G** *3/00*
U.S. Cl. 60—39.72 R **1 Claim**



1. A vortex generator in a combustor for a ramjet type engine comprising:

a hollow cylindrical chamber of substantial wall thickness having an opening completely across its inner diameter for allowing airflow in an axial direction through said chamber;

a flame front;

flameholder means positioned within said chamber a substantial distance from said opening for creating said flame front;

a plurality of spaced solid wings of airfoil cross section positioned upstream of said flameholder, each of said wings projecting from said chamber wall at right angles to the longitudinal axis of said chamber with the free ends

of each of said wings extending to a position adjacent each other near the center of said chamber and having the cordwise dimension of each of said wings slanted with respect to axial airflow through said chamber;

whereby airflow through said chamber is caused to eddy downstream of the trailing edges of the wings to actively and rapidly mix the air with the area of said flameholder.

3,921,392
FLAME TUBE SHROUD ASSEMBLY FOR FUEL INJECTOR NOZZLE

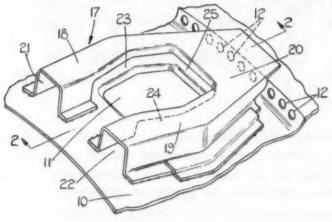
Eric Carr, Blackburn, and Kenneth McClave, Nelson, both of England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed July 2, 1974, Ser. No. 485,250

Claims priority, application United Kingdom, July 5, 1973, 32091/73

Int. Cl.² F02G *3/00*

U.S. Cl. 60—39.74 R **2 Claims**



1. A flame tube assembly for a gas turbine engine, said assembly including a flame tube wall, a fuel sprayer head mounted in an aperture in said flame tube wall, a clearance between said fuel sprayer head and the wall around the aperture for flow of air from an air passage outside said flame tube wall to the interior of said flame tube, and a shroud mounted on the exterior of said flame tube wall and disposed around said clearance, said shroud comprising two hollow limbs which extend on either side of said fuel sprayer head and a downstream end portion which interconnects said two hollow limbs at downstream ends thereof, each said limb having an air inlet at the upstream end thereof which is disposed upstream of said clearance relative to the direction of flow of air in the air passage, and also having an exit opening on an inner side thereof which is presented to said fuel sprayer head.

3,921,393
SCREW THREAD FUEL SLINGER

Joseph W. Bracken, Jr., Redford Township, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 29, 1974, Ser. No. 518,682

Int. Cl.² F02M *39/02*; F02C *7/22*

U.S. Cl. 60—39.74 S **9 Claims**

1. A mixed fluid combustion products generator comprising:

A. a housing;

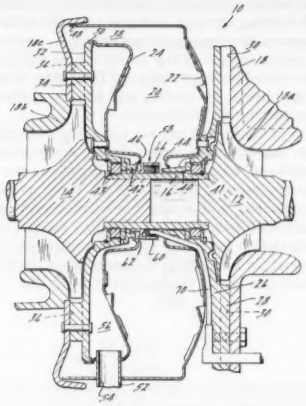
B. an axially extending shaft mounted for rotation relative to the housing;

C. an annular liner defining a combustion chamber encircling the shaft;

D. a fuel slinger secured to the shaft for rotation therewith and defining a radially inwardly facing generally axially extending surface concentric with the shaft axis and radially spaced from the outer periphery of the encircled shaft portion;

E. means for supplying fuel to the inwardly facing surface; and

F. screw thread means defining at least one helical groove on the inwardly facing surface having one end communicating chamber the combustion chamber for providing



the primary path for fuel to flow from the inner surface to the combustion chamber.

3,921,394
HETEROGENEOUS MONOPROPELLANT COMPOSITIONS AND THRUST PRODUCING METHOD

Stanley Tannenbaum, Morristown, N.J., assignor to Thiokol Corporation, Bristol, Pa.

No Drawing. Filed Apr. 22, 1964, Ser. No. 363,336

Int. Cl.² C06D *5/10*

U.S. Cl. 60—217 **36 Claims**

1. Novel thixotropic, monopropellant compositions comprising a mixture of a fuel selected from the group consisting of inorganic carbides, inorganic borides and inorganic boride-carbide mixtures, a liquid oxidizer selected from the group consisting of nitric acid, nitric acid enriched with NO_2, nitric acid enriched with NO_2 and HF, nitrogen tetroxide, hydrogen peroxide, and perchloric acid dihydrate and thixotroping agent selected from the group consisting of carbon, silica, clay, and mixtures thereof.

23. A method of developing thrust in a reaction motor, having a combustion chamber and a discharge opening, comprising the steps of igniting in said combustion chamber, a heterogeneous propellant composition of from about 15–40 parts by weight of a solid fuel selected from the group consisting of inorganic carbides, inorganic borides and inorganic boride-carbide mixtures, from about 60–95 parts by weight of a liquid oxidizer selected from the group consisting of perchloric acid dihydrate, concentrated H_2O_2 and N_2O_4, and up to about 10 parts by weight of optional propellant adjuvants and a thixotroping agent selected from the group consisting of carbon, silica, clay, and mixtures thereof; and venting the combustion gases derived therefrom through said discharge opening.

3,921,395
ENGINE EXHAUST GAS PURIFYING MEANS

Masayuki Kawata, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Oct. 23, 1974, Ser. No. 517,315

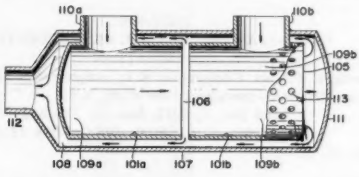
Claims priority, application Japan, Oct. 24, 1973, 48-123263

Int. Cl.² F01N *3/10*

U.S. Cl. 60—282 **5 Claims**

1. Engine exhaust gas purifying means comprising inner shell means defining reaction chamber means therein, said

inner shell means including at least two shell elements, the first of said shell elements having a closed end and an open end and the second of said shell elements having opposite open ends, said first and second shell elements being disposed with the open end of the first shell element and one of the open ends of the second shell elements opposed with each other with a spacing therebetween, an outer shell enclosing said inner shell means with a gas passage defining spacing



therebetween and having outlet port means provided at a portion adjacent to the closed end of the first shell element of the inner shell means, first inlet tube means substantially radially passing through the outer shell and opening to said first shell element, and second inlet tube means substantially radially passing through the outer shell and opening to said second shell element, said first and second inlet tube means being secured to the outer shell and respectively to the first and second shell elements.

3,921,396

EXHAUST GAS PURIFICATION SYSTEM

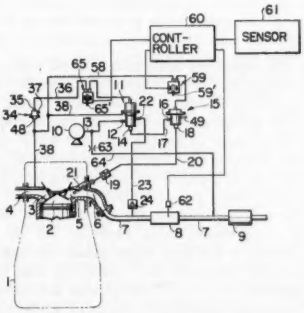
Hidetaka Nohira, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 1, 1974, Ser. No. 466,027

Claims priority, application Japan, Nov. 20, 1973, 48-129727

Int. Cl.² F02B *75/10*

U.S. Cl. 60—290 **2 Claims**



1. In an internal combustion engine having an intake system and an exhaust system with exhaust ports and an exhaust tube having a catalytic converter therein, in which the exhaust gas from the engine body is recombusted in the catalytic converter in the exhaust tube to remove its non-combusted component before it is exhausted into the atmosphere, a secondary air supply control system comprising:

an air pump for supplying secondary air to the exhaust system,

a first change-over valve for selectively directing the secondary air from the air pump to the exhaust tube on the up-stream side of the catalytic converter or to a second change-over valve,

said second change-over valve selectively directing the secondary air from the first change over valve either to or adjacent the exhaust ports of the engine or to the atmosphere,

a first diaphragm provided in the first change-over valve for switching the first change-over valve according to negative pressure in the intake system of the engine or atmospheric pressure,

an on-off valve provided in a first duct leading atmospheric pressure to said first diaphragm and switchable on or off according to the negative pressure in said intake system, a first control valve in the duct provided between the on-off valve and the first change-over valve for communicating said on-off valve and said first change-over valve or for communicating said duct with the atmosphere according to the temperature of the catalytic converter, a second diaphragm provided in the second change-over valve for switching the second change-over valve according to the negative pressure in said intake system, and

a second control valve provided in a second duct directing the negative pressure from said intake system to the second diaphragm and for communicating the intake system and said second diaphragm or for communicating said second duct with the atmosphere according to the temperature of the catalytic converter, wherein the secondary air for the exhaust system is adapted to be selectively supplied to the upstream side of the catalytic converter and to or adjacent the exhaust ports of the engine.

3,921,397

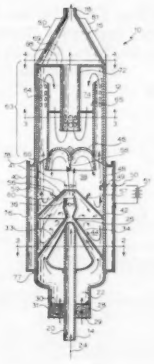
SILENCER AGAINST TOXIC GASES

Emilio Guarderas G., Maldonado No. 2551, Quito, Ecuador

Continuation of Ser. No. 225,961, Feb. 14, 1972, abandoned. This application Nov. 30, 1973, Ser. No. 420,549

Int. Cl.² F01N *3/10*

U.S. Cl. 60—303 **2 Claims**



1. A muffler for use with an internal combustion engine comprising:

A. a sheath,

B. an exhaust tube within the sheath, the exhaust tube terminating in a constriction creating a venturi, the exhaust tube adapted to receive exhaust gases from the internal combustion engine,

C. means for feeding fresh air to the venturi, whereby the fresh air is mixed with the exhaust gases to form an air-exhaust gas mixture,

D. a combustion chamber within the sheath,

E. a resistance heating element within the combustion chamber which when a low voltage potential is impressed across it will become heated to the combustion temperature of the gases in the combustion chamber and,

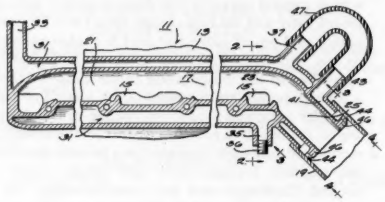
F. auxiliary ignition means comprising a metal sphere mounted on a ceramic cone.

3,921,398

EXHAUST MANIFOLD WITH HIGH RISE WATER TUBE

Gerald E. Kashmerick, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 10, 1973, Ser. No. 387,341
Int. Cl.² F01N 7/06, 3/02
U.S. Cl. 60—310 **5 Claims**



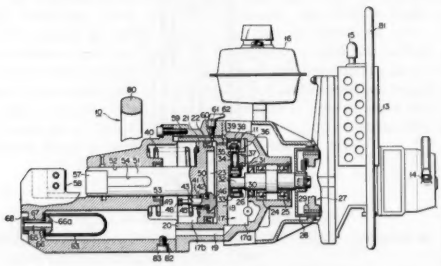
1. An exhaust gas manifold comprising an exhaust gas passageway including an exhaust gas inlet portion, and an elbow portion extending directly downwardly from said inlet portion, a coolant jacket extending around said inlet and elbow portions of said exhaust gas passageway, and valveless means for discharging coolant from said jacket and including means extending above the top of saio coolant jacket in non-heat exchanging relation to said exhaust gas passageway for maintaining said jacket full of coolant.

3,921,399

FLUID PRESSURE-OPERATED DEVICE

Masamitsu Ishihara, 628 Hirai, Kannami-cho, Tagata, Shizuoka, Japan

Filed Dec. 13, 1974, Ser. No. 532,386
Claims priority, application Japan, Dec. 14, 1973, 48-141748[U]; May 30, 1974, 49-62331[u]
Int. Cl.² F15B 15/18
U.S. Cl. 60—478 **11 Claims**



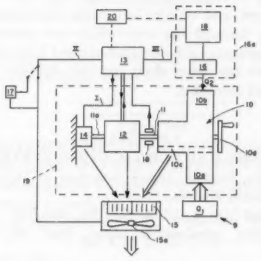
1. A fluid pressure-operated device comprising a cylinder, a piston slidably disposed in said cylinder and partitioning said cylinder into two parts one of which is a low pressure chamber and the other of which is a high pressure chamber, a first spring for urging said piston toward the high pressure chamber, pump means for feeding a pressure fluid to the high pressure chamber, thereby moving the piston toward the low pressure chamber against the biasing force of said first spring, and at least one return valve means for allowing, when the piston has been moved toward the low pressure chamber by a prescribed stroke, the pressure fluid within the high pressure chamber to escape therethrough into the low pressure chamber so as to return the piston to the high pressure chamber, said return valve means including a rod element axially and movably extending through the piston and having one end protruded into the high pressure chamber and the other end protruded into the low pressure chamber, a first passageway formed through the piston and allowing the high pressure chamber to communicate with the low pressure chamber, a closing element integrally provided on said one end of the rod element to close the first passageway due to the action of the fluid pressure in the high pressure chamber, and a stop against which, when the piston has been moved by a prescribed stroke, said other end abuts to permit the closing element to open the first passageway.

3,921,400

CRYO-ELECTRIC ENGINE-REFRIGERATOR COMBINATION

Gerald K. Pitcher, Chappaqua, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 4, 1972, Ser. No. 311,892
Int. Cl. G05b 11/01; F25b 49/00; F01k 13/02
U.S. Cl. 60—517 **7 Claims**

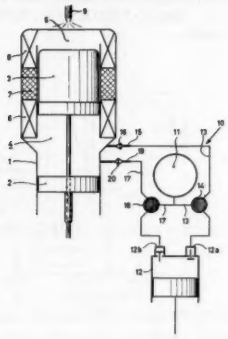


1. A self-regulating apparatus for use with a Vuilleumier (V-M) refrigerator for refrigerating a cryo-device which is in thermal communication therewith and which uses electric power, the refrigerator having a hot-end operable to receive heat from a source of heat, a cold-end where refrigeration is produced, working gas alternately compressed and expanded in said two ends, a cooler for discharging heat from the compressed gas, and a power output element with refrigeration produced corresponding to the speed of said output element, the gas compression being excessive for the refrigeration produced with a resulting output power through said element, the regulating apparatus for controlling both long and short term operation of the V-M refrigerator according to predetermined operating parameters, comprising: electric power generator means driven by said shaft, means for monitoring the speed of said output element and registering the occurrence of either excessive or insufficient speed causing unsteady frequency, voltage, power or refrigeration, brake means operable with electric power from said generator for applying a resisting torque on said output element for controlling the speed of said element, control means responsive to said monitoring means directing an amount of said electric power to said brake means corresponding to the amount of excessive or insufficient speed of said output element as a short term control, the control means also directing electric power to said cryo-device when so demanded, the apparatus further comprising a heat exchanger for absorbing heat from said generator, brake, and cooler, the control means further comprising means for varying the heat received by said hot end as a long term control.

3,921,401
HOT GAS MACHINE AND CONTROL DEVICE FOR VARYING THE POWER THEREOF

Jacobus Hubertus Abrahams, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,711
Claims priority, application Netherlands, May 21, 1973, 7307041
Int. Cl.² F01B 29/10
U.S. Cl. 60—521 3 Claims



1. In a hot gas apparatus including reciprocating compression and displacer pistons defining a variable-volume working space for working fluid, the improvement in combination therewith of a device for controlling the amount by weight of working fluid in said working space, comprising: a storage container for containing a quantity of said working fluid, a compressor for said fluid including inlet and outlet means thereof, one-way inlet and outlet valves operable with said working space, a first conduit for communicating said fluid between a first set of three elements, namely said working space outlet valve, said compressor inlet and said storage container, third valve means for selectively inter-connecting two of said three elements, a second conduit for communicating said fluid between a second set of three elements, namely said working space inlet valve, said compressor outlet, and said storage container, and fourth valve means for selectively inter-connecting two of said three elements of said second set, whereby fluid can be transferred to said compressor inlet from either the working space outlet valve or the storage container, and from the compressor outlet to either the storage container or the working space inlet valve.

3,921,402
THERMAL ACTUATOR

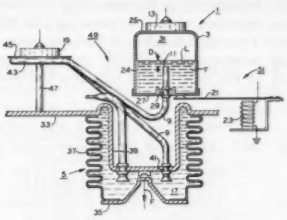
Paige W. Thompson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 28, 1974, Ser. No. 473,764
Int. Cl.² F03G 7/06
U.S. Cl. 60—531 47 Claims

1. A method of operating a thermal actuator having a pair of means for containing a vaporizable fluid comprising the steps of:

a. controlling heating and cooling of one of the containing means for respectively effecting transfer of fluid therein from of fluid to the one containing means; and

b. vaporizing at least a portion of the fluid during its return

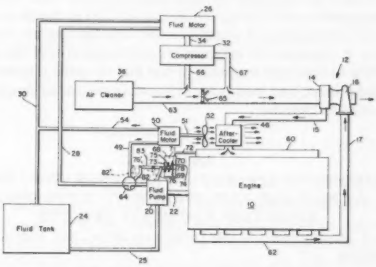


to the one containing means for throttling the volumetric flow rate thereof.

3,921,403
AUXILIARY AIR SUPPLY SYSTEM AND METHOD FOR TURBOCHARGED ENGINES

Charles E. McInerney, Torrance; Robert L. Cholvin, and Hans Egli, both of Santa Monica, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 30, 1974, Ser. No. 465,646
Int. Cl.² F02B 33/44
U.S. Cl. 60—606 24 Claims



1. In combination with an internal combustion engine which receives compressed charge air from an exhaust gas-driven compressor, means for providing auxiliary air to said engine, said means comprising:

fluid pumping means driven by the internal combustion engine;

auxiliary air compressor means driven by fluid from said fluid pumping means; and

means for controlling the flow of auxiliary air from said auxiliary air compressor means to the exhaust gas-driven compressor in response to the charge air requirements of the internal combustion engine.

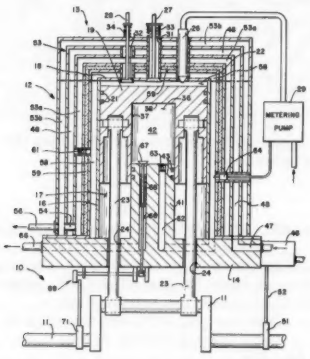
3,921,404
INTERNAL COMBUSTION AND STEAM POWERED ENGINE

Lloyd R. Mason, Boonville, Calif., assignor to Tu-N-One PWR, Cloverdale, Calif.

Filed June 21, 1974, Ser. No. 481,483
Int. Cl.² F01K 23/10
U.S. Cl. 60—618 8 Claims

1. In an engine: an axially extending cylinder having a side wall, a cylinder head forming a closure at one end of the cylinder, an axially movable piston mounted in the cylinder and cooperating with the cylinder wall and cylinder head to form a first chamber of variable volume, an axially extending

stationary piston mounted at the end of the cylinder opposite the cylinder head, an axially extending closed bore formed in the movable piston and opening through the end of said piston opposite the cylinder head for receiving the stationary piston therein, the stationary piston cooperating with the walls of the bore to form a second chamber of variable volume, means for introducing combustible fuel into the first chamber where combustion of the fuel serves to move the movable piston



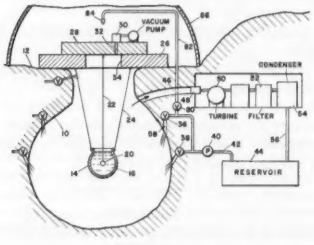
away from the cylinder head, means for exhausting combusted gas from the first chamber, means for heating water with heat energy produced by the combustion of fuel in the first chamber and introducing the heated water into the second chamber where it vaporizes to produce steam, expansion of the steam serving to cool said movable piston and to move it toward the cylinder head, and means for exhausting expanded steam from the second chamber.

3,921,405

METHOD AND APPARATUS FOR GENERATING STEAM BY NUCLEAR EXPLOSION WITH SUPPRESSED RADIATION AND BLAST EFFECTS

Jan J. Rosciszewski, 4784 Panaroma Drive, San Diego, Calif. 92116

Filed Dec. 19, 1973, Ser. No. 426,050
Int. Cl. F01k *21/00*; F03g *7/00*
U.S. Cl. 60—644 **19 Claims**



1. A steam generator using a nuclear explosion to provide steam comprising,

a large sealed expansion chamber,

means for substantially evacuating said chamber,

means for suspending a nuclear bomb in substantially the center of the chamber in a surrounding working fluid,

said working fluid being spaced from the wall of the chamber,

means for substantially evacuating gases from said chamber around said working fluid,

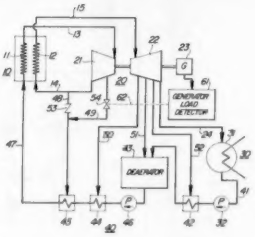
means for exploding the bomb causing the bomb to generate heat vaporizing the working fluid and making steam and expanding it to a much larger volume to obtain desirable pressures and temperatures for power generation, and means for conducting the steam into a power generator.

3,921,406

STEAM POWER GENERATOR APPARATUS OF THE REGENERATIVE CYCLE TYPE

Tsugutomo Teranishi, and Yoshiyuki Amano, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 14, 1974, Ser. No. 469,877
Claims priority, application Japan, June 15, 1973, 48-66902
Int. Cl.² F01K *7/04*, *7/40*
U.S. Cl. 60—660 **4 Claims**



4. A steam power generator of the regenerative cycle type comprising steam generator means, steam turbine means, and higher and lower pressure feed water heaters connected in series with one another, wherein the feed water heater of the lower pressure side is connected to steam extraction lines connected to at least two expansion stages of said steam turbine means differing from each other in pressure, the feed water heater of the higher pressure side being connected to a steam extraction line connected to a higher pressure expansion stage of said steam turbine means, whereby steam extraction is introduced into the feed water heater of the higher pressure side at a reduced pressure when the steam turbine means is operated under a higher load and steam extraction can be introduced thereinto without having its pressure substantially reduced when the steam turbine means is operated under a lower load and whereby steam extraction from the lower pressure stage can be introduced into the feed water heater of the lower pressure side when the steam turbine is operated under a higher load and steam extraction from the higher pressure stage can be introduced thereinto when the steam turbine means is operated under a lower load.

3,921,407

OIL SPILL CONTAINING BOOM

James Henry Neal, 612 - 15 St., N.W., Calgary, Alberta, Canada

Filed June 19, 1973, Ser. No. 371,397
Int. Cl.² E02B *15/04*
U.S. Cl. 61—1 F **3 Claims**

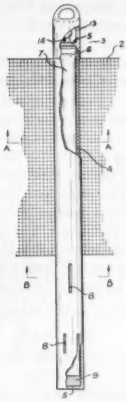
1. An oil-containing boom comprising, in combination:

an elongate band of longitudinally flexible, water-permeable, oil-impermeable material having sufficient stiffness transversely to maintain itself erect;

a plurality of rigid, spaced spars, buoyant throughout the greatest part of their lengths, each said spar extending longitudinally across the full width of the band and being attached thereto to form a combination which moves in water as a unit;

each said spar comprising a hollow casing, apertured and weighted at its lower end and containing a buoyant, water

and oil impermeable material in its upper end, whereby, when the boom is dropped onto a body of water, the spars



will right themselves and float in a generally vertical position.

3,921,408

ANTI-HEAVE PROTECTIVE SYSTEM

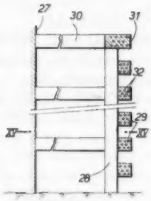
Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to C. G. Doris (Compagnie Generale pour les Developments Operationnels des Richesses), Paris, France

Continuation-in-part of Ser. No. 324,305, Jan. 17, 1973. This application July 2, 1974, Ser. No. 485,255

Claims priority, application France, Jan. 18, 1972, 72.01560

Int. Cl. E02b *3/06*

U.S. Cl. 61—3 **12 Claims**



1. Protective system against the heaving action of waves of water comprising a bulky obstacle means having a spreading-out surface and providing a substantially uninterrupted impingement area of substantial extent athwart the wave path and exposed to the impact of successive surges of the heave to induce along said spreading-out surface alternate ascending and descending motions of a mass of water of a thickness greater than a boundary layer of water, and means providing a plurality of energy dissipating material elements in front of said spreading-out surface at a distance sufficient to penetrate into said mass of water beyond said boundary layer, said elements serving to slow down ascending and descending water motions and phaseshift the same with respect to the heave, said bulky obstacle means comprising a bulky wall structure having a closed contour and exposed to the impact of said successive surges of the heave, and said energy dissipating material elements comprising an energy dissipating structure arranged in closed contour around the bulky wall structure and comprising a plurality of beams and a plurality of posts supporting the beams in vertically spaced relation at a distance from the bulky wall structure sufficient to dip into said mass of water beyond said boundary layer.

3,921,409

SUPPORT FOR THE ROOF OF AN EXCAVATION

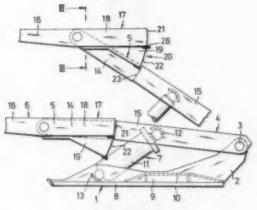
Günter Blumenthal, Westerholt, Germany, assignor to Bochumer Eisenhutte Heintzmann & Co., Bochum, Germany

Filed Feb. 5, 1975, Ser. No. 547,450

Claims priority, application Germany, Feb. 15, 1974, 2407227

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D **18 Claims**



1. A support for the roof of an excavation comprising a base having one side facing towards, and another side facing away from, the face of an excavation; a shield having one end portion pivoted to said base in the region of said other side, and another end portion closer to said one side; and adjustable support engaging said base and said shield for supporting the shield in upright position; an end cap pivotably mounted on said other end portion of said shield; and interdigitating portions provided on said end cap and on said other end portion and remaining in interdigitating engagement with one another in pivoted positions of said end cap relative to said other end portion so as to avoid the development of a gap between them in any of said pivoted positions.

3,921,410

SYSTEM AND METHOD OF PERMAFROST PILE FORMING

Kenneth W. Philo, 7 Palm Ave., San Rafael, Calif. 92708

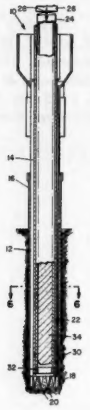
Filed July 5, 1974, Ser. No. 486,050

Int. Cl.² E02D *5/22, 5/60*

U.S. Cl. 61—53.52 **19 Claims**

1. A method for placing a pile in permafrost or other hard ground which is normally frozen, said method comprising the steps of excavating an annulus in the ground having an outer diameter slightly greater than the outer diameter of the pile and leaving a substantially undisturbed core, said excavating step including the step of placing a casing and means for dispensing sand at the lower end of the casing in said annulus; inserting the pile into the hole inside the casing; removing the casing from the hole and simultaneously dispensing sand with

said dispensing means at the lower end of the casing to fill the space vacated around the pile as the casing is removed from



the hole; and wetting the sand so that the sand is frozen in place to encapsulate the pile.

3,921,411

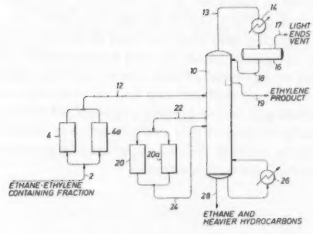
C_2 SPLITTER OPERATION WITH SIDE DRAW REMOVAL OF WATER TO PREVENT HYDRATE FORMATION

Walter A. Gleich, Pasadena, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 334,324, Feb. 21, 1973, abandoned. This application Oct. 23, 1974, Ser. No. 517,119

Int. Cl.² F25J *3/00*

U.S. Cl. 62—18 **5 Claims**



1. In a continuous distillation process for recovering ethylene comprising introducing into a distillation zone a C_2 hydrocarbon fraction consisting essentially of ethane and ethylene and additionally containing from about 0.05 ppm weight to about 50 ppm weight soluble water, the improvement which comprises:

a. removing as a side draw a portion of the hydrocarbon and water from said distillation zone at a point intermediate between the point at which the feed mixture is introduced to said zone and the bottom of the zone;

b. passing said side draw through a drying zone; and

c. returning the effluent from said drying zone to said distillation zone, whereby the distillation zone is continuously operated without substantial hydrate formation and ethane is removed as a bottoms product substantially free from non-hydrocarbons.

3,921,412

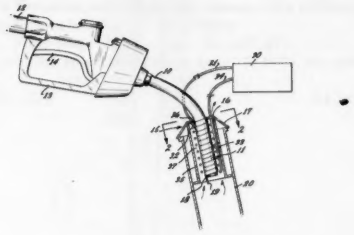
VAPOR RECOVERY APPARATUS EMPLOYING DISPENSING NOZZLE WITH CONDENSING CAPACITY

Stephen D. Heath, San Diego, and Lorenzo Borbolla, Jr., Dulzura, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed July 18, 1974, Ser. No. 489,818

Int. Cl.² F17C *13/00*

U.S. Cl. 62—54 **8 Claims**



1. A vapor recovery apparatus comprising in combination:

a. a dispensing nozzle and attached liquid load line;

b. a receiving tank having a filler opening to receive the nozzle therein;

c. means for effecting a continuous engagement between said dispensing nozzle and said receiving tank around the filler opening;

d. refrigerant means surrounding said dispensing nozzle on the receiving tank side of said continuous engagement means when the nozzle is inserted in such filler opening; and

e. a source of refrigerant communicating with said refrigerant means for chilling and condensing vapors in the zone surrounding the nozzle on the receiving tank side of the continuous engagement means.

3,921,413

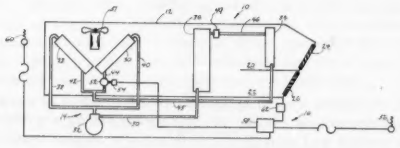
AIR CONDITIONING UNIT WITH REHEAT

Orin J. Kohlbeck, Davenport, Iowa, assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Nov. 13, 1974, Ser. No. 523,478

Int. Cl.² F25D *17/00*

U.S. Cl. 62—173 **7 Claims**



1. An air-conditioning unit of the reheat-type for supplying conditioned air to at least one served zone, said air conditioning unit comprising:

a hot deck portion;

a cold deck portion;

means for selectively routing at least a portion of an air stream to be conditioned through said hot deck portion to each served zone;

means for selectively routing at least a portion of an air stream to be conditioned through said cold deck portion to each served zone;

a reheat coil disposed in said hot deck for selectively reheating the air stream flowing through said hot deck portion;

at least two condensers having their outlets in parallel refrigerant flow communication with the inlet of said reheat coil;

at least one compressor having its pressure side in refrigerant flow communication with the inlet of said condensers;

an evaporator disposed upstream of said reheat coil for selectively cooling an air stream flowing into said hot deck portion and said cold deck portion, the inlet of said evaporator being in refrigerant flow communication with the outlet of said reheat coil and the outlet of said evaporator being in refrigerant flow communication with the suction side of said compressor;

a refrigerant flow regulating valve for controlling the flow of refrigerant between at least one of said condensers and said reheat coil; and,

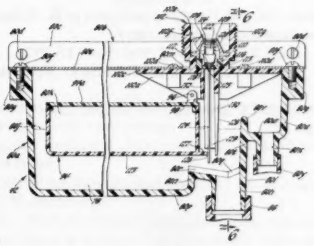
a served zone air condition sensor disposed within each served zone, each of said sensors being immediately responsive to the conditions of the air within the served zone for actuating said regulating valve to restrict the flow of refrigerant from one of said condensers to said reheat coil when the served zone air conditions within a served zone deviate from a desired condition.

3,921,414

WATER FILL ARRANGEMENT FOR CLEAR CUBE ICE MAKER

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,628
Int. Cl.² F25D *17/06*
U.S. Cl. 62—188 **4 Claims**



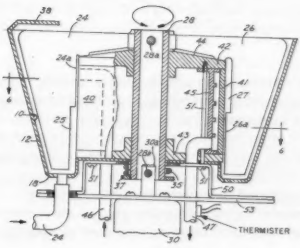
3. In combination with an insulated cabinet wall defining a freezer compartment adapted to contain air at subfreezing temperatures, an ice maker in said freezer compartment, said ice maker comprising a tray on the inside of said insulated cabinet wall having side and bottom tray walls adapted to contain water therein at a predetermined level, cooling means supplying air at sub-freezing temperatures to the water contained in said tray at said predetermined level, and water fill means for refilling said tray with water to said predetermined level, said fill means including a reservoir housing adapted to contain water therein in a liquid state at said predetermined level and means for maintaining water in said housing at said predetermined level, said last named means including a float pivotally supported about a transverse axis in said housing, an inlet valve positioned in the housing top wall adjacent one end thereof adapted for supplying a water level to said housing from a domestic supply of water available at pressures normally between about 20 pounds per square inch and 120 pounds per square inch, an outlet positioned in the bottom wall of said housing, said inlet valve having an annular valve seat, a valve plug engaging in one position against said seat to close an inlet port, said plug having a centrally positioned stem extending through said valve port for limited tilting movement, said float responsive to the level of liquid in said housing and pivotally connected in said housing at a point intermediate said valve seat and the normal water level in said housing, said float having probe means at its lower end contacting said valve stem, said probe means being operable to overcome the line water pressure force on said plug and tilt said stem and plug and open said port whenever said float pivots downwardly below a predetermined minimum level of water in said housing, and whereby the incoming water causes said float to pivot upwardly to said predetermined level causing the water pressure force on said valve plug to immediately return said stem to its vertical position to close said port, said housing outlet having its inlet entrance in a stepped portion of said bottom wall, the surface of said stepped portion having a plurality of canted drain areas sloped toward said entrance to prevent the formation of a blocking surface tension film whereby the initial fill of water into said housing flows therefrom to said tray in a self starting manner.

3,921,415

FLAKE ICE MAKER

Theodore Kattis, 1601 Ridgewood Drive, St. Louis, Mo. 63126

Filed Aug. 30, 1974, Ser. No. 502,031
Int. Cl.² F25C *1/14*
U.S. Cl. 62—354 **9 Claims**



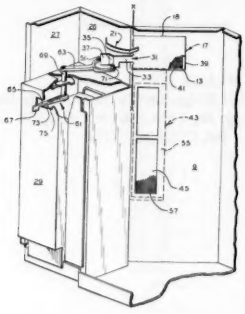
1. In a flake ice maker having an annular water chamber with an annular inner and an annular outer wall for maintaining a predetermined water level therein, means for refrigerating one of said walls producing a layer of ice thereon, rotary flaking means mounted in the annular water chamber for progressively breaking flakes from the layer of ice formed on said one of said walls and relatively narrow chute-type discharge means for ice depending tangentially from the annular chamber, the improvement wherein said outer annular wall of said water chamber is outwardly sloped from bottom to top substantially forming a frustoconical surface, wherein said outwardly sloped annular wall extends substantially around said chamber.

8. In a flake ice maker having an annular water chamber with an inner annular and an outer annular wall for maintaining predetermined water level therein, means for refrigerating one of said walls producing a layer of ice thereon, rotary flaking means for progressively breaking flakes from the layer of ice formed on said one of said walls, and relatively narrow chute-type discharge means having a ramp extending from adjacent the bottom of said water chamber to a discharge point above the maximum water height for ice depending tangentially from the annular chamber, the improvement wherein said discharge means includes stationary projections into the path of ice travelling up the ramp to the discharge point for preventing rearward movement of ice travelling up the discharge means, said discharge means further including downwardly directed means for directing outwardly any drippage of water from said ice and for preventing drippage of said water down said chute into said water chamber.

3,921,416
SPRING BIAS FOR DAMPER DOOR OF AN AIR CONDITIONING UNIT

Raymond J. Murnane, Minoa, and Theodore S. Bolton, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 25, 1974, Ser. No. 517,975
Int. Cl.² F25D *17/06*
U.S. Cl. 62—427 **4 Claims**



1. In an air conditioning unit having a casing, a partition dividing the unit into an evaporator section and a condenser section, and a port extending through said partition for enabling the flow of air between the evaporator section and the condenser section, apparatus for selectively opening and closing said port, said apparatus comprising:

a door dimensioned to cover said port;

means for mounting said door for pivotal movement about an axis between port opening and port closing positions; and

an open-ended leaf spring for biasing said door to the port closing position, one end of said spring being attached to said partition on one side of said axis and the other end of said spring being attached to said door on the opposite side of said axis, the line of force of said spring extending between the ends of said spring and said spring surrounding said axis when said door is shut and said line of force shifting toward said axis as said door pivots towards the port opening position, whereby said bias decreases from a maximum value as said door is moved from the port closing towards the port opening position.

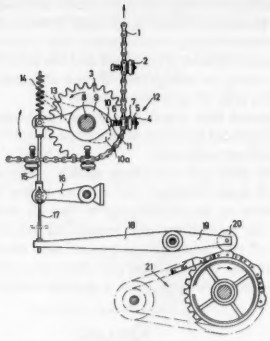
3,921,417
APPARATUS FOR CONVEYING FILLING THREADS TO A WARP KNITTING MACHINE

Karl Kohl, Chlorodontstrasse 10, 6053 Obertshausen near Offenbach, Germany

Filed Mar. 20, 1972, Ser. No. 236,264
Claims priority, application Germany, Mar. 26, 1971, 2114699
Int. Cl.² D04B *23/12*
U.S. Cl. 66—84 A **3 Claims**

1. An apparatus for conveying filling threads to a warp knitting machine, comprising

1. a filling thread conveyor chain,
2. a plurality of thread clamps spacedly mounted along the chain,
   a. each of the thread clamps being sequentially moved into a position for receiving a respective one of the filling threads,
3. a cam means mounted at said position for moving a respective one of the thread clamps upon operation of the cam means between a clamp opening and clamp closing position,
4. control means for operating the cam means, and
5. a pattern mechanism,

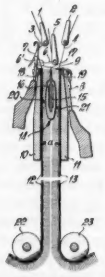


a. the control means being operatively associated with the cam means and the pattern mechanism for operating the cam means in response to the pattern mechanism.

3,921,418
DEVICE FOR PRODUCING A PLUSH-LIKE SURFACE STRUCTURE

Rainer Apken, Rheydt, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Feb. 16, 1971, Ser. No. 115,392
Claims priority, application Germany, Feb. 4, 1970, 2006753
Int. Cl.² D04B *23/06*, *23/08*, *23/10*
U.S. Cl. 66—87 **4 Claims**



1. In a double needle-row knitting machine, an assembly for producing a plush-like surface structure comprising a pair of knitting needle rows spaced from one another, a pair of knocking-over bars disposed adjacent said needle row, respectively, within said space therebetween, and spaced in turn, from one another, said needle rows and said knocking-over bars being actuable for knitting respective individual webs located adjacent the respective knocking-over bars and connected by pile threads extending therebetween to form a base fabric web, said knocking-over bars having respective edges for firmly holding the stitches knitted by the needles, and a severing device located in the space between said knocking-over bars directly below said edges of said knocking-over bars for severing said pile threads to separate said individual webs, whereby said pile threads are severed just after being formed before the tension is relieved to provide for severance substantially at the middle of the pile threads and resulting in individual fabric webs of substantially the same pile height.

3,921,419
APPARATUS FOR THE CONTINUOUS TREATMENT OF TEXTILE FIBERS

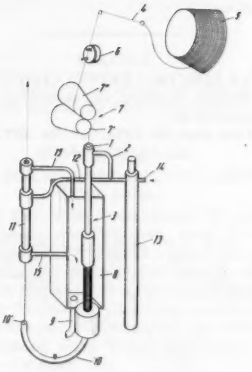
Dieter Rosenkranz; Karl Bous, both of Wuppertal; Roland Schmidt; Werner Engelhardt, both of Neviges-Donberg, and Günter Vermehren, Emesdetten, all of Germany, assignors to Hacoba Textilmaschinen GmbH & Co. KG, Wuppertal, Germany

Filed June 14, 1972, Ser. No. 262,685

Claims priority, application Germany, June 22, 1971, 2130759; Switzerland, Nov. 4, 1971, 16141/71

Int. Cl.[2] B08B *3/12;* **D06F** *37/00*

U.S. Cl. 68—5 D **9 Claims**



1. A device for continuously treating a strand of textile material with a fluid, comprising:

an elongated treatment chamber connectable with a source of said fluid:

a pipe extending through said chamber for conducting said strand therethrough;

a strand — feed mechanism disposed at one end of said pipe and including a conical roller, a second roller resting on said conical roller, and a thread guide shiftable along the line of contact of said rollers for feeding said strand between the nip thereof into said pipe through said one end; a U-shaped guide tube connected to the other end of said pipe beyond said chamber and having an upwardly directed outlet;

a tuyere zone tube disposed above said outlet for receiving said strand therefrom and having suction connections and supply connections for selectively introducing and removing a treatment fluid and air into and from said tuyere zone tube;

a suction duct connected to the bottom of said chamber and communicating with a suction source; and

a flap in said chamber for varying the effective cross-section of said duct at the communication thereof with said chamber.

3,921,420
APPARATUS FOR WET PROCESSING OF TEXTILE MATERIALS

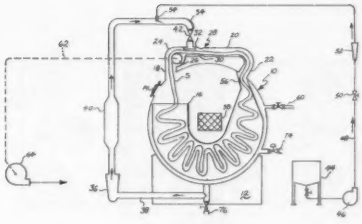
Christoph W. Aurich, Clemson, S.C., and James Keith Turner, Lincolnton, N.C., assignors to Gaston County Dyeing Machine Company, Mount Holly, N.C.

Continuation-in-part of Ser. No. 318,087, Dec. 26, 1972, abandoned. This application July 20, 1973, Ser. No. 381,268

Int. Cl.[2] D06B *3/28, 15/04*

U.S. Cl. 68—5 C **15 Claims**

1. Apparatus adapted for wet processing textile strand material with a treating liquor formulated for effective application at a short liquor ratio, said apparatus comprising a pressure kier, means for circulating said strand material in traveling strand form to and from a pleated accumulation within said kier, said circulating means including a venturi-jet through which said strand material is trained for circulation and a closed system for supplying an inert gas to said jet under



pressure so as to generate an aspirating influence thereat for inducing strand material circulation, and means for applying said treating liquor formulation from a source outside said kier by metering the formulation into the inert gas supply ahead of the venturi-jet during circulation of said strand material.

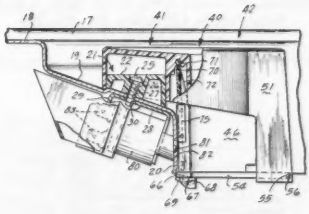
3,921,421
REMOVABLE DETERGENT DISPENSER FOR AUTOMATIC WASHER

Gerald L. Kretchman, Stevensville, and William Ohmann, St. Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 18, 1974, Ser. No. 525,081

Int. Cl.[2] D06F *39/02*

U.S. Cl. 68—17 R **9 Claims**



1. An automatic detergent dispenser assembly for an automatic clothes washing machine of the vertical axis type, wherein a removable dispenser cup is located during operation of the machine above a washing tub and beneath a closeable lid affording access to the tub and the dispenser, and a bowl of the dispenser cup has a trap door operable by solenoid means to dispense detergent into said tub, comprising:

a mounting bracket affixed by attachment means to an upper side of a flange of the washing machine beneath said lid,

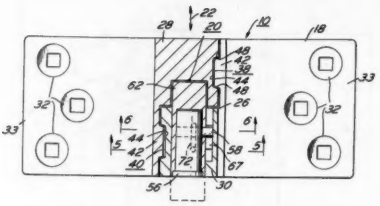
said attachment means also securing said solenoid means to an interior side of the flange opposite said mounting bracket; and

a mounting portion of said dispenser cup being removably engageable with said mounting bracket and holding the bowl of said dispenser cup over said washing tub for release of detergent thereinto upon operation of said solenoid means.

3,921,422
LOCKING BAR SYSTEM

Russell W. Walters, Reading, Pa., assignor to BMR Security Products Corporation, Richmond, Ky.

Filed Oct. 4, 1973, Ser. No. 403,460
Int. Cl.² E05B *63/00*
U.S. Cl. 70—97 **10 Claims**

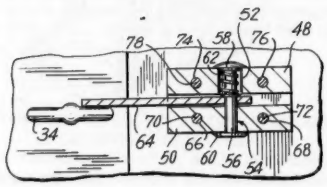


1. A bar lock system comprising:
a. a pair of strike plates having alignable lug members, each of said lug members having a bore opening defining an inner wall, at least one of said lug members having a continuously formed passage of predetermined contour formed within said inner wall;
b. lock assembly means having (1) a locking pin of constant extension therefrom and movably actuated within said passage, (2) a locking tube insertable within said bore openings of said lug members, and (3) lock means positionally located within said locking tube; said locking pin being rigidly secured to and immovable with respect to said lock means said lock means and said locking pin being rotatable with respect to said locking tube through a predetermined angular displacement, and said locking tube being fixedly secured with respect to rotational movement within said bore openings of said lug members.

3,921,423
TAMPER-PROOF DOOR LOCK ASSEMBLY

Jesse R. Hollins, 40 Stoner Ave., Great Neck, N.Y. 11021

Filed July 5, 1974, Ser. No. 485,775
Int. Cl.² E05B *13/08*
U.S. Cl. 70—416 **1 Claim**

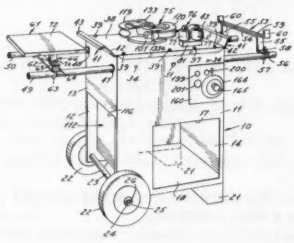


1. A door lock assembly comprising a door, a door frame, a dead bolt assembly secured to said door, said dead bolt assembly including a dead bolt, an oblong knob having an elongated axis on the inside surface of said door and rotatable for controlling the extension and retraction of said dead bolt, a lock cylinder having an opening on the outside surface of said door for receiving a key for controlling the extension and retraction of said dead bolt, said door frame including a dead bolt receptacle, a housing affixed to said door on the inside surface thereof, said housing including two spaced apart parallel sections with a gap extending between said sections, a first of said sections including an opening extending there through, a second of said sections including an opening extending there through and in alignment with said opening extending through said first of said sections, means bolting said first section to said door and means bolting said second section to said door, a member extending through said openings, a pivot plate having an opening and pivotable about said member in said gap, a spring having two ends surrounding said member and affixed at one end of said member and abutting said pivot plate at said other end whereby said pivot plate is prevented from freely moving, said pivot plate having a flat rectangular configuration, said pivot plate having a first and second position, said pivot plate in said first position abutting a portion of said oblong knob parallel to said elongated axis and preventing said knob from rotating to retract said door bolt from an extended position to a retracted position, and in said second position spaced from said knob to enable said knob to be rotated, said pivot plate in said first and second positions being in a single plane.

3,921,424
PORTABLE ELECTRIC DRIVEN CONDUIT BENDER

Vernon W. Pearson, Rockford, Ill., assignor to Greenlee Bros. & Co., Rockford, Ill.

Filed Sept. 18, 1974, Ser. No. 507,022
Int. Cl.² B21B *31/06*
U.S. Cl. 72—1 **16 Claims**



1. In an electric driven conduit bender having a housing and a rotatable bending shoe means operatively mounted on said housing, an electric motor for driving said shoe means, and a control circuit means including switch means for energizing and controlling the operation of said electric motor, the combination comprising:
a. cam means including an adjustable cam for controlling the operation of said switch means; and,
b. a cam adjustment means mounted externally on said housing for adjusting said adjustable cam.

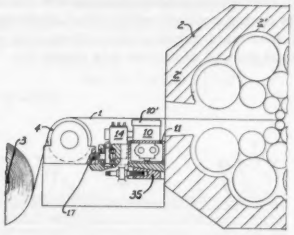
3,921,425
PROCESS AND APPARATUS FOR PRODUCING METAL SHEETS OF BETTER FLATNESS

Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn. 06720

Filed June 13, 1974, Ser. No. 479,032
Int. Cl.² B21B *33/00*, *37/06*
U.S. Cl. 72—4 **7 Claims**

1. In the tension rolling of metal strip in a mill having work rolls and a deflecting roll, wherein the strip passes from the deflecting roll to the work rolls of a mill, the method of producing strip of improved flatness while avoiding the danger of scratching the surface by contact with any instrumentality, which includes the steps of applying a uniform deflecting pressure to a plurality of areas of equal size and shape disposed transversely of the strip, said areas being defined by the projections, on the strip, of the perimeters of a number of pressure pots located close to, and parallel to, said strip, adjustably mounting said pots to maintain a fixed position relative to the strip, by causing equal volumes of air to pass between the boundaries of said areas and the strip surface, thus producing a pressure differential between the inside and outside of said areas; the said pressure differential being uniform

for all areas so long as the strip deflections are uniform, but varying when said deflections are not uniform, and adjusting



the roll pressure transversely across the strip to restore the uniformity of said deflections when they vary.

3,921,426

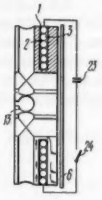
INDUCTOR FOR MAGNETIC-PULSE STAMPING OF FLAT BANKS

Igor Vasilievich Bely, ulitsa Pushkinskaya 74, kv.28.; Leonid Davidovich Gorkin, ulitsa Beketova, 19/13, kv.15., both of Kharkov; Valery Sergeevich Dmitriev, Belyaevo-Bogorodskoe, kvartal 48, korpus 17, kv.208., Moscow; Vladimir Jurievich Khvorost, ulitsa Chernyshevskogo, 95, kv.9., Kharkov; Lev Timofeevich Khimenko, poselok Pokotilovka, ulitsa Ulyanovskaya, 35., Kharkov, and Alexandr Tikhonovich Mezhuev, ulitsa Dnepropetrovskaya, 19, kv.8., Kharkov, all of U.S.S.R.

Filed Nov. 15, 1974, Ser. No. 524,307

Int. Cl.² B21D *26/14*

U.S. Cl. 72—56 **2 Claims**



1. An inductor for magnetic-pulse stamping of flat blanks, comprising: a cylindrical current-conducting frame having end surfaces, the geometrical form of one of said end surfaces, which comprises the working end surface, being adapted to the given profile or contour of the flat blank it adjoins, the opposite end surface having radial slits mutually communicating with radial holes provided in the body of said current-conducting cylindrical frame; a winding accommodated in a radial annular slot of said current-conducting cylindrical frame formed therein adjacent the side surface thereof between said radial holes and said working end surface.

3,921,427

INFLATABLE DEVICE

Billy C. Malone, and Floyd A. Halbardier, both of Houston, Tex., assignors to Lynes, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 315,028, Dec. 14, 1972. This application Sept. 6, 1974, Ser. No. 503,848

Int. Cl.² B21D *15/06*

U.S. Cl. 72—59 **15 Claims**

1. In an inflatable device for use in a tubular member:

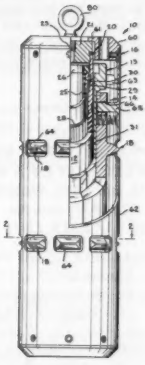
a. spaced annular heads;

b. inflatable means secured between said spaced annular heads;

c. closure means for said heads, one of said closure means having an opening for conducting inflating fluid to said inflatable means;

d. a plurality of first members positioned adjacent each other circumferentially of said inflatable means and extending longitudinally therealong;

e. additional members overlapping said adjacent first members and extending longitudinally thereof;



f. support means supporting said first and additional members for radial movement while maintaining said additional members in overlapping relation with adjacent first members upon inflation of said inflatable device; and

g. projection means on said additional members engageable with the tubular member upon inflation of said inflatable means.

3,921,428

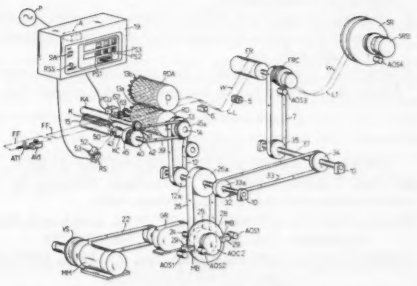
WEB PROCESSING APPARATUS AND ELECTRIC CONTROL THEREFOR

Donald E. Freres, Racine, Wis., assignor to Sterling Tool Company, Racine, Wis.

Filed Jan. 2, 1975, Ser. No. 538,035

Int. Cl.² B21D *53/04*

U.S. Cl. 72—185 **10 Claims**



1. In web processing apparatus for forming embossed or perforated segments of predetermined length from a continuous moving web of material: web feed means; rotary die means separate from said web feed means and to which said web is fed by said web feed means and operable to provide embossments or perforations in said web; rotary cut-off means separate from said rotary die means and to which the embossed or perforated web is continuously fed by said rotary die means and operable to cut segments from the embossed or perforated end of said web while said web is moving; drive means

for driving said web feed means and said rotary die means in mechanically synchronized relationship; selectively operable, electrically operated clutch means connected between said drive means and said cut-off means for intermittently operating said cut-off means from said drive means in mechanically synchronized relationship with said die means to cut said segments; and electric control means for operating said clutch means and responsive to rotation of said rotary die means to operate said clutch means and effect a single cutting operation of said cut-off means in response to a predetermined amount of rotation of said rotary die means and thereby provide an embossed or perforated segment of predetermined length and containing a predetermined number of embossments or perforations.

3,921,429

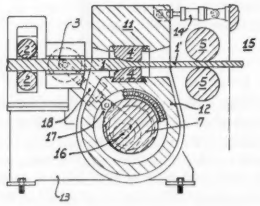
PROCESS AND APPARATUS FOR MODIFYING THE CROSS SECTION OF A SLAB

Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn. 06720

Filed Apr. 11, 1974, Ser. No. 459,900

Int. Cl.² B21B *13/18*

U.S. Cl. 72—189 **9 Claims**



1. A press for forging slabs, said press having

a. at least one pair of edge forming tools disposed to act normally on the edges of said slab,

b. means to reciprocate said tools rapidly,

c. means for rapidly adjusting said press, even during operation, for width of slab to be produced, from a maximum width down to one-half said maximum width,

d. and a pair of thickness reducing tools extending across the entire width of the slab, disposed down stream from said edge forming tools,

e. said last named tools being located in frames pivotally mounted on a vertical axis situated along the longitudinal axis of said slab, and

f. means for rapidly adjusting the angle of said last named tools with respect to the longitudinal axis of said slab.

3,921,430

APPARATUS FOR ROLLING SEAMLESS TUBES

Jean Paul Calmes, Lausanne, Switzerland, assignor to Innocenti Santeustacchio S.p.A., Brescia, Italy

Division of Ser. No. 435,046, Jan. 21, 1974, abandoned. This application Nov. 12, 1974, Ser. No. 523,178

Claims priority, application Italy, Jan. 23, 1973, 19496/73

Int. Cl.² B21B *45/02*

U.S. Cl. 72—201 **4 Claims**

1. Apparatus for rolling seamless tubes comprising:

a roll train having a plurality of roll stands defining a rolling axis;

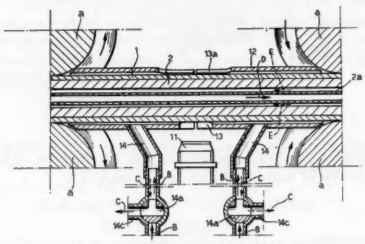
a restraining device upstream of said roll train,

a mandrel attachable at the head end thereof to said restraining device,

a plurality of tubular tanks located between adjacent said roll stands on the rolling axis of said roll train and positioned so that a tube being rolled and said mandrel can pass therethrough during rolling,

inlet and discharge conduits connected to each said tubular tank, and

valves in said inflow and discharge conduits to control the inflow of coolant along said inlet conduits into said tubular tanks during cooling and to effect discharge of said coolant from said tubular tanks along said discharge conduits at the end of said cooling stage;



each said tubular tank having a discharge opening in the lowermost side thereof, and a vertically movable support positioned beneath each said discharge opening, means for running each said support between a raised position where said support closes said discharge opening and projects into said tank to provide support for said mandrel during cooling and a lowered position where said discharge opening is unobstructed whereby any water in said tanks is discharged therefrom.

3,921,431

DRAWROLL ARRANGEMENT

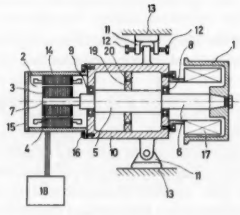
Armin Wirz, Dietlikon, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Nov. 8, 1973, Ser. No. 413,987

Claims priority, application Switzerland, Nov. 10, 1972, 16378/72

Int. Cl.² B21C *1/02*

U.S. Cl. 72—289 **4 Claims**



1. A drawroll arrangement comprising

a machine frame;

a shaft;

a godet mounted on one end of said shaft;

a drive motor mounted at the opposite end of said shaft, said motor having a rotor secured on said opposite shaft end;

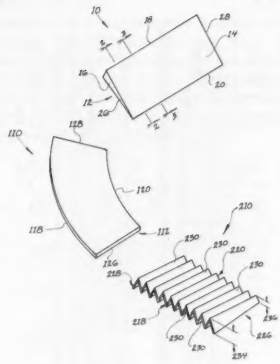
a bearing housing axially adjustably mounted on said machine frame and including a pair of end walls; and

a pair of bearings each mounted in a respective one of said housing end walls and rotatably supporting said shaft with said ends disposed in cantilevered fashion.

3,921,432
METHOD OF FORMING A TAPERED PLEATED FILTER PLEAT FOLD SEPARATOR AND A SEPARATOR FORMED THEREBY

Richard D. Rivers, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Mar. 24, 1975, Ser. No. 561,107
Int. Cl.² B21D *13/00*
U.S. Cl. 72—362 10 Claims

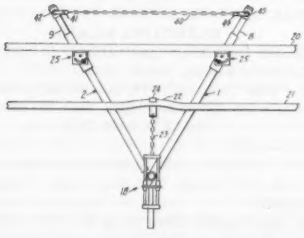


1. A method of fabricating a tapered pleated filter pleat fold separator for use in pleated filter elements, said method comprising the steps of:
   - forming a generally rectangular separator blank having a generally wedge-shaped cross-section transverse to one axis of the said rectangular separator blank from a malleable material;
   - compressing said rectangular blank in a plane normal to the plane containing said wedge-shaped cross-section to form an arcuate shaped blank such that one of the edges of said rectangular separator blank comprises the major arc and the opposite edge comprises the minor arc of said arcuately-shaped blank; and,
   - pleating said arcuately-shaped blank to form said tapered pleated filter pleat fold separator.

3,921,433
APPARATUS FOR STRAIGHTENING AUTOMOBILE FRAMES AND THE LIKE

Walter D. Whitney, San Carlos, Calif., assignor to Whitney Manufacturing Co., San Carlos, Calif.

Filed Dec. 26, 1973, Ser. No. 427,631
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B21D *1/14*
U.S. Cl. 72—461 9 Claims

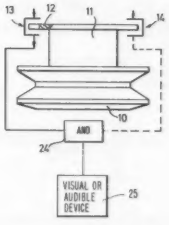


1. A support structure for mounting pulling apparatus for use in straightening automobile frames and the like, comprising:
   - a base assembly,
   - said base assembly including a pair of ground supported horizontally disposed elongated legs,
   - means on said base assembly for pivotally connecting said legs together at one of their corresponding ends for swinging said legs toward and away from each other about a vertical axis,
   - a vertically disposed post secured at its lower end to said base assembly,
   - means on said post for securing thereto a pulling device adapted to be connected to a portion of an automobile frame,
   - abutment means on one of said legs for engaging a portion of an automobile frame for resisting the pull of said pulling device, and
   - means on the other of said legs for connecting the same to a fixed object.

3,921,434
MOTION DETECTING APPARATUS

Michael David Lowen, Berkhamsted, and Ronald Newby, Boreham Wood, both of England, assignors to John Laing & Son Limited, London, England

Filed June 5, 1974, Ser. No. 476,401
Claims priority, application United Kingdom, June 18, 1973, 28760/73
Int. Cl.² G01P *3/26*
U.S. Cl. 73—37 3 Claims



1. An apparatus for detecting movement of a member having perforate and imperforate portions, said apparatus including spaced fluid jet devices each provided with a fluid input and a fluid output spaced from said input and interconnected by a bypass passage, the arrangement being such that each jet device is aligned with said perforate and imperforate portions of the member and said devices are so positioned that, when the member is stationary, fluid flow across at least one of the jets is interrupted, which condition is sensed by the drop in fluid pressure at the output and indicated by a visual or audible device.

3,921,435
APPARATUS FOR DETECTING VALVE FAILURE IN A RECIPROCATING PUMP

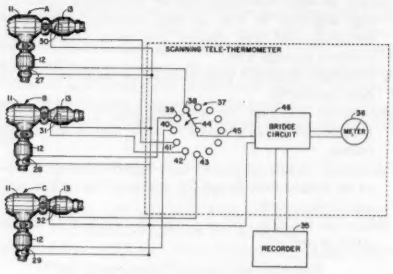
Willis W. Howard, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Oct. 12, 1973, Ser. No. 406,043
Int. Cl.² G01M *3/40*
U.S. Cl. 73—40 6 Claims

1. Apparatus for detecting leakage of fluid past a valve of a reciprocating pump having at least two suction valve cages and at least two discharge valve cages mounted externally of the pump body which comprises:
   - a. a plurality of temperature sensing elements, one for each pump valve cage;

b. means for mounting a temperature sensing element on the outer surface of each valve cage;

c. means responsive to said temperature sensing element for indicating the temperature of each valve cage; and



d. means for comparing the temperature of each of said valve cages with the temperature of at least one other of said valve cages.

3,921,436

METHOD FOR CHECKING TIGHTNESS OF HOLLOW BODIES AND MORE PARTICULARLY OF HEAT EXCHANGERS, AND DEVICE FOR EMBODYING SAID METHOD

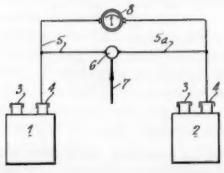
Alain Edouard Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Apr. 17, 1974, Ser. No. 461,581

Claims priority, application France, May 10, 1973, 73.16958

Int. Cl.² G01N *3/02*

U.S. Cl. 73—40 **7 Claims**



1. A device for checking tightness of hollow bodies, wherein a hollow body to be tested is compared to a substantially identical reference hollow body, said device comprising a support for the reference hollow body and for the hollow body to be tested, a first set of caps for closing all apertures but one of each of the two hollow bodies whereby one aperture is free, a second set of caps for connection of the free aperture of each of said two hollow bodies to a common distributing valve with three positions, a first position for which the two hollow bodies are simultaneously connected to a source of compressed gas to bring a testing compressed gas into said two hollow bodies, a second position for which the two hollow bodies are simultaneously isolated from the source of compressed gas, and a third position for which the two hollow bodies are drained off of the testing compressed gas, each cap of the second set of caps being further connected to an inlet of a differential manometer through a pair of substantially identical pipes; further comprising an air-cylinder and a duct wherein the distribution valve is connected to the free aperture of the reference hollow body through said air-cylinder, said air-cylinder being shunted by said duct, thus producing a loss of pressure in said cylinder, said air-cylinder containing a piston freely mounted therein, a switch being controlled by this piston, said switch having a closing position connecting a voltage source to a checking circuit, to check that the testing gas is really applied inside said reference hollow body.

3,921,437

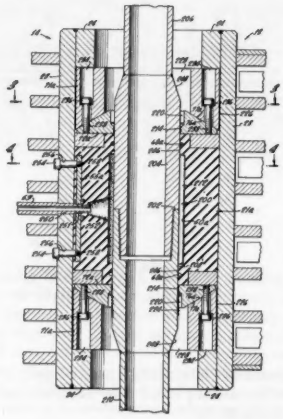
APPARATUS AND METHOD FOR LEAK TESTING OF TOOL JOINTS BETWEEN DRILL PIPE SECTIONS

Ernest D. Hauk, 1315 E. 23rd St., Signal Hill, Calif. 90806

Filed Mar. 29, 1974, Ser. No. 456,161

Int. Cl.² G01M *3/28*

U.S. Cl. 73—40.5 R **7 Claims**



3. A method of testing a coupling which interconnects adjacent sections of pipe, the outer diameters of said pipe sections being smaller than the outer diameter of said coupling, said coupling having a central connection therein, said method comprising:

a. providing a longitudinally split casing having jaws and containing an elastomeric packer which is correspondingly longitudinally split, the length of said packer being less than that of the coupling to be tested,

b. providing at each end of said packer and within said casing a toothed extrusion-prevention and gripping ring adapted to bite into said coupling in response to closing of said jaws and also in response to fluid-pressurization of said packer, and further adapted to prevent extrusion of packer material when the packer is fluid pressurized,

c. closing said jaws and packer on said coupling to cause said toothed rings at opposite ends of said packer to bite into said coupling on opposite sides of the central connection in said coupling,

d. pressurizing said packer with fluid to thereby cause additional biting of said rings into said coupling, and

e. determining whether or not said fluid leaks inwardly from said packer through said central connection.

3,921,438

LOW TEMPERATURE LIQUID STORAGE TANK OF THE INTERNAL HEAT INSULATING TYPE HAVING CRACK DETECTING MEANS

Kihei Katsuta, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 13, 1974, Ser. No. 479,144

Claims priority, application Japan, June 21, 1973, 48-70212

Int. Cl.² G01M *3/04*

U.S. Cl. 73—40.7 **1 Claim**

1. An internally thermally insulated low temperature liquid storage tank with leakage detecting means, comprising:

a tank shell;

a liquid impermeable layer lining the tank shell;

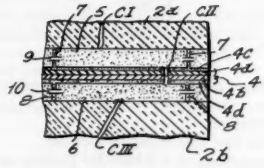
a layer of thermal insulation interposed between the liquid impermeable layer and the shell;

a secondary liquid impermeable barrier layer provided in the layer of thermal insulation, intermediate the thickness of the thermal insulation;

a first layer of gas permeable sheet material located within the layer of thermal insulation next to the side of the secondary liquid impermeable barrier which faces inside the tank;

a second layer of gas permeable sheet material located within the layer of thermal insulation next to the side of the secondary liquid impermeable barrier which faces outside the tank;

a plurality of gas impermeable partition members extending through the thickness of each layer of gas permeable sheet material and dividing the gas permeable sheet material into a plurality of compartments grouped in at least one set inside the secondary liquid impermeable barrier layer and at least another set outside the secondary liquid impermeable barrier layer;



a plurality of conduit means extending through the partition members, each conduit means serving to intercommunicate the adjacent ones of the compartments of a set on a respective side of the secondary liquid impermeable barrier layer;

means for pumping a supply of inert gas through selected ones of the respective sets of compartments via the respective conduit means and for collecting said gas thereafter;

the collecting means including a gas analyzer means for detecting the presence in the collected inert gas of leakage from the inside of the tank through the first-mentioned liquid impermeable layer into said first gas permeable sheet within the respective set of compartments;

the collecting means further including a gas analyzer means for detecting the presence in the collected inert gas of leakage from outside of the tank through the tank shell into said second gas permeable sheet within the respective set of compartments.

3,921,439

METHOD AND APPARATUS FOR SELECTIVELY REMOVING IMMISCIBLE FLUID SEGMENTS FROM A FLUID SAMPLE STREAM

Donald A. Burns, Putnam Valley, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Aug. 27, 1973, Ser. No. 392,156
Int. Cl. G01n *33/16*
U.S. Cl. 73—61.1 R **32 Claims**

1. A method of analyzing a series of fluid samples for constituent of interest, comprising:

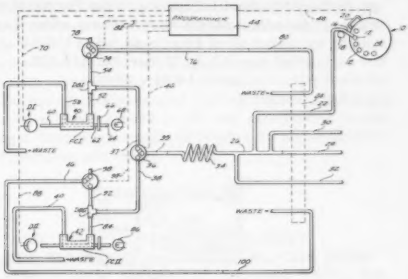
flowing the samples successively in a stream in a first conduit;

passing to an analysis station for analysis at least a portion of sample from said stream in a second conduit having an inlet in communication with an outlet with said first conduit;

shunting at least a portion of said sample stream to divert it from said analysis station while stopping the flow of said sample in said second conduit at said analysis station;

placing said first and second conduits in communication with one another; and

subsequently washing out said sample in said second conduit at said analysis station by the subsequent flow of fluid in said first and second conduits.

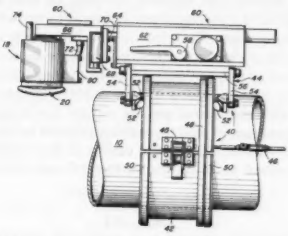


3,921,440

ULTRASONIC PIPE TESTING SYSTEM

Endre Leslie Toth, Lancaster, Ohio, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 2, 1975, Ser. No. 538,033
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **8 Claims**



1. A system for nondestructive testing internal soundness of structural members having a generally circular cross section comprising in combination:

a track and platform assembly including means for securing said assembly to the structural member to be tested and means for guiding said platform along a path defined by said securing means;

a drive and search head assembly removably secured to said platform, said drive and search means including a support member slidably fitted to said drive portion of said drive and search head assembly;

said support member carrying a fluidtight search head housing having an open bottom;

an ultrasonic transducer pivotally mounted within said search head housing for movement angularly to the vertical axis of said housing for focusing a beam through the open bottom of said housing;

a flexible boot closing said open bottom, said boot transmitting ultrasonic pulses and providing a contact surface to structural members being tested, said boot having a plurality of orifices to allow fluid couplant contained in said boot to contact said structure member to provide an interface of couplant between said boot and said structural member;

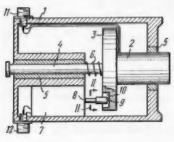
means for powering said transducer and detecting return signals to said transducer; and

electronic means for controlling said drive and search head assembly for movement along a path at a predetermined rate and for controlling the angular position of said transducer.

3,921,441
ACOUSTIC HEAD

Boris Vasilievich Tomilov, ulitsa Chkalova 9, kv. 74, Khabarovsk; Jury Nikolaevich Olshvang, ulitsa Furmanova 46, kv. 41, and Ljudmila Ivanovna Kozhevnikova, ulitsa Kamenotesov, 2, kv. 101, both of Sverdlovsk, all of U.S.S.R.

Filed Nov. 13, 1973, Ser. No. 415,378
Int. Cl.² G01N 29/00
U.S. Cl. 73—71.5 US 4 Claims

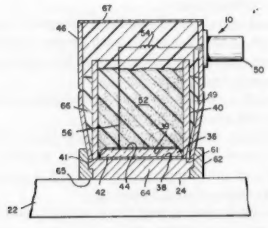


1. An acoustical ultrasonic transducer head for the nondestructive testing of solid articles, comprising a housing, a holder member for a transducer mounted slidably in said housing, a transducer carried fixedly and coaxially by said holder member, said holder member being provided with a radially extending groove in the face thereof, spring means positioned within said housing adapted to bias said holder member and said transducer carried thereby outwardly of said housing, motor means carried by said housing provided with a rotatable shaft, and an eccentric member mounted on said shaft adapted to ride within said radial groove whereby operation of said motor effects the movement of said eccentric member within said radial groove and the consequent cyclical arcuate movement of said transducer relative to the surface of said article without shifting the center of the transducer from a predetermined point on the surface of said article.

3,921,442
ACOUSTIC COUPLANT FOR USE WITH AN ULTRASONIC SEARCH UNIT

Sidney Soloway, Wilton, Conn., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed Nov. 28, 1973, Ser. No. 419,653
Int. Cl.² G01N 29/04
U.S. Cl. 73—71.5 US 6 Claims



1. A method for ultrasonically testing a workpiece or the like by a transducer transmitting sound waves therein, the method including the steps of

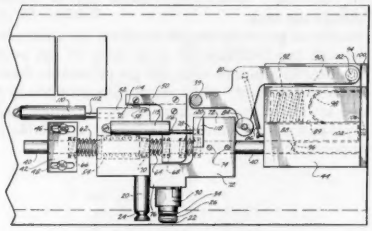
placing a hydrophilic material in air-tight contact between said transducer and the surface of said workpiece, said material is a polymer containing reactive groups capable of forming hydrogen bonds with a liquid, cohesively bonded thereto in a manner substantially preventing the loss of said liquid therefrom, and

transmitting ultrasonic energy through said material.

3,921,443
APPARATUS FOR MEASURING TENSILE PROPERTIES OF HAIR

Robert W. Yates, Woodland Hills, Calif., assignor to Redken Laboratories, Inc., Van Nuys, Calif.

Filed Dec. 26, 1973, Ser. No. 427,928
Int. Cl.² G01N 3/14
U.S. Cl. 73—95 3 Claims



1. Apparatus for measuring the tensile properties of hair or other fibers, comprising:

a base member,

a movable first hair engaging member,

means supported on the base for guiding said first member along a linear path,

a movable second hair engaging member spaced from the first member;

the hair under test extending between the first and second members,

means supported on the base for guiding said second member along a linear path parallel to the path of movement of the first member,

first spring means extending between the first member and the base for resisting movement of the first member with increasing force with displacement of the first member in the direction of the second member,

means including second spring means extending between the second member and the base for moving the second member in the opposite direction at substantially constant velocity to put the hair under uniformly increasing tension against the urging of the first member by the first spring means,

first indicating means for indicating changes in position of the first member relative to the base,

second indicating means for indicating changes in position of the second member relative to the first member , and a third spring means extending between the first member and the base for urging the first member in the opposite direction than that of the first spring means to provide an adjustable null position of the first member.

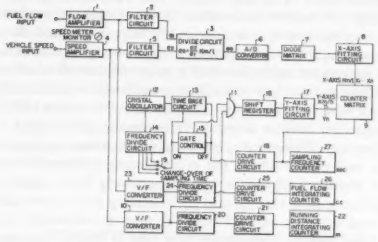
3,921,444
FREQUENCY METER FOR VEHICLE RUNNING SPEED VERSUS FUEL CONSUMPTION RATE

Mitsuru Taira, Toyota, and Giichiro Ono, Tokyo, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Oct. 18, 1974, Ser. No. 515,890
Claims priority, application Japan, Oct. 30, 1974, 49-48438
Int. Cl.² G01F 9/00
U.S. Cl. 73—114 5 Claims

1. A frequency meter for vehicle running speed versus fuel consumption rate comprising a speed meter, a fuel flow meter, means to calculate an instant value of the fuel consumption rate from the ratio of the vehicle running speed measured by said speed meter and the fuel flow rate measured by said fuel flow meter, means to designate a region out of a first group of a plurality of predetermined steppedly arranged regions according to said instant value of the fuel consumption rate, said

designated region being the one to which said instant value belongs, means to designate a region out of a second group of a plurality of predetermined steppedly arranged regions according to said speed measured by said speed meter, said designated region being the one to which said speed belongs,



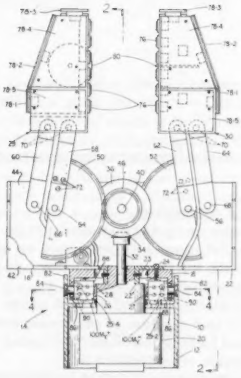
a counter matrix composed of counters corresponding to a matrix constituted by said first and second groups of regions and means to actuate a particular counter for each predetermined time, said particular counter being the one located at the crossing point of a set of regions which are at said instant designated in said first and second groups.

3,921,445

FORCE AND TORQUE SENSING METHOD AND MEANS FOR MANIPULATORS AND THE LIKE

John W. Hill, Palo Alto, and Antony J. Sword, San Francisco, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Oct. 15, 1973, Ser. No. 406,553
Int. Cl. G01l *5/16*
U.S. Cl. 73—133 R **23 Claims**



1. Sensing means for use in sensing at least one component of force and torque components along mutually orthogonal X, Y and Z axes transmitted between first and second members having a longitudinal axis extending along the Z axis, said sensing means comprising:

resilient coupling means coupling said first and second members to allow for relative movement therebetween and through which said X, Y and Z axes extend;

a plurality of sensing units radially displaced from said Z axis at the resilient coupling means, each of which sensing units includes first and second cooperating means attached to said coupled first and second members, respectively, so that relative movement between said first and second cooperating means is produced upon transmission of forces and torques between said coupled first and second members through said resilient coupling means; said forces and torques being transmitted through said resilient coupling means substantially independently of said sensing units, and

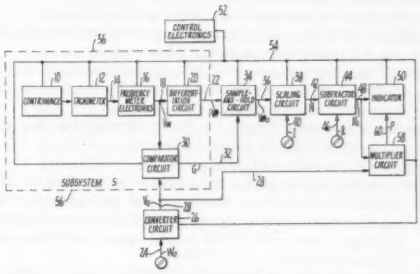
means for obtaining at least first and second electrical outputs from each of said sensing units, the outputs from each sensing unit being respectively responsive only to relative movement of said cooperating means along a first direction perpendicular to the radius extending from the Z axis through the associated sensing unit and responsive only to relative movement of said cooperating means along a direction mutually orthogonal to said associated first direction and radius.

3,921,446

METHOD OF MEASURING TORQUE

Karl Ludloff, 519 Midvale Ave., Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 132,007, April 7, 1971, Pat. No. 3,817,092. This application July 9, 1973, Ser. No. 377,584
Int. Cl.² G01M *15/00*
U.S. Cl. 73—136 R **10 Claims**



1. A method for determining the contribution to the torque of a rotating system by any subsystem of said system without the necessity of appreciable perturbation of the operation of said system, wherein the inertial properties of said system are known, and wherein the particular relation for said subsystem torque is known in terms of both said system torque and other subsystem torques and involves a total of M—M being a number greater than 2—independent subsystem torques acting collectively on said system, said method comprising:

M independent torque determinations at a particular angular velocity wherein each said torque determination is established under operating conditions of said system specified to insure independence of said M torque determinations,

combining said torque determinations according to said particular known relation so as to isolate said subsystem-torque contribution to said system torque from the contribution of other subsystem torques,

and making the established torque available for further use, each of said M torque determinations comprising,

a measurement by a controlled means of angular acceleration of a rotating element of said system,

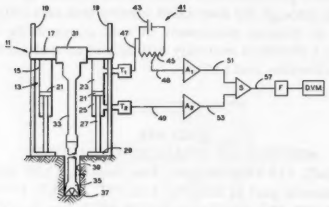
using said measurement of angular acceleration to obtain torque from the known inertial properties of said system,

and averaging as many measurements as may be required to establish said torque to specified accuracy.

3,921,447
DRILLING FORCE INDICATOR

Mig Allen Howard, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Feb. 24, 1975, Ser. No. 550,059
Int. Cl.² E21B *47/00*
U.S. Cl. 73—151 **2 Claims**



2. The method of measuring the total drilling force exerted resulting from the weight of the drill stem and bit in addition to that exerted by fluid in upper and lower chambers of a hydraulic cylinder used to move the drill stem, said method comprising the steps of:

sensing the fluid pressure in the upper chamber and converting this pressure to an output electrical signal;

sensing the fluid pressure in the lower chamber and converting this pressure to an output electrical signal;

amplifying each output signal to a value proportional to the hydraulic forces acting on the piston by the fluid in the upper and lower chambers;

determining the difference between the signals that are proportional to said hydraulic forces;

displaying visually said difference;

suspending the bit in the bore hole with the fluid in said chambers to produce pressures and associated output signals proportional to the weight of the drill stem and bit; biasing at least one of said output signals such that said difference is zero;

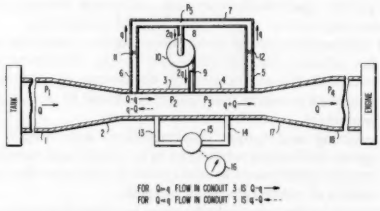
drilling with the bit against the earth;

whereby the determined and displayed difference is representative of the force of the bit on the earth.

3,921,448
MASS FLOWMETER

Walter Masnik, Basking Ridge, N.J., and Gerald Bloom, Spring Valley, N.Y., assignors to Flo-Tron, Inc., Patterson, N.J.

Filed Aug. 29, 1973, Ser. No. 392,664
Int. Cl.² G01F *1/34*, *1/44*
U.S. Cl. 73—205 D **10 Claims**

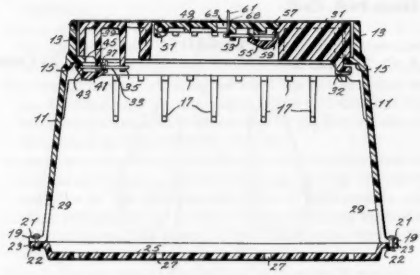


1. An extended range mass flowmeter for measuring the mass flow rate of fluid flowing through a main conduit from an inlet to an outlet portion thereof comprising a connecting conduit for serially interconnecting said inlet and outlet conduit portions to pass a volumetric flow rate Q of fluid from said inlet to said outlet conduit portions, said connecting conduit comprising a throat having a reduced cross section relative to the cross sections of the inlet and outlet conduit portions dimensioned to act as a flow restrictor along a substantial portion of its length, means for recirculating a constant volumetric flow rate of fluid $2q$ to said throat to provide a constant and equal additive and subtractive component of volumetric flow rate q of fluid in said throat to the volumetric flow rate of fluid Q in said throat, said recirculating means comprising a constant volumetric flow rate $2q$ recirculating device coupled between an intermediate point in said throat and through a respective further conduit to said connecting conduit at a point upstream and a point downstream of said intermediate point, flow restrictor means within said further conduit serving to insure that a volumetric flow rate of fluid q through said further conduit is constant, and means for measuring the differential pressure in said connecting conduit between two points where the recirculating volumetric flow rate q is additive and subtractive respectively with respect to the volumetric flow rate Q, said recirculating device providing one of said additive and subtractive rates of volumetric flow rate of fluid q to the volumetric flow rate of fluid Q upstream of said intermediate point and the other of said additive and subtractive rates of volumetric flow rate of fluid q downstream of said intermediate point.

3,921,449
METER BOX FOR FLUID METER EQUIPMENT

William L. Hauffe, Warrensburg, and Narayan C. Saha, Decatur, both of Ill., assignors to Mueller Co., Decatur, Ill.

Filed Apr. 10, 1974, Ser. No. 459,791
Int. Cl.² G01F *15/14*
U.S. Cl. 73—273 **10 Claims**



1. A meter box comprising

a side wall enclosure having an opening at the top thereof,

a meter box lid removably positioned on said side wall enclosure at the top thereof, said meter box lid having an aperture therethrough,

a reader lid rotatably secured to said meter box lid and positioned in said aperture of said meter box lid.

a first U-shaped locking rod slidably mounted with respect to the underside of said reader lid,

a latching member secured to said locking rod on one leg thereof for reciprocating movement therewith, said latching member having a lower cammed surface and an upper relatively wide contact surface cooperating with the underside of said lid for preventing the latch from turning with respect to said rod and said lid,

a spring biasing means positioned about the other leg of said U-shaped rod for normally biasing said locking rod and said latch into engagement with the underside of said meter lid to thereby lock said reader lid in a closed position and for biasing said locking rod and latch toward the underside of said meter lid when said latch and said rod are moved against said bias to free said latch from the underside of said meter lid,

a second U-shaped locking rod slidably mounted with respect to the underside of said meter box lid,

a second latching member secured to said second locking rod on a leg thereof, for reciprocating movement therewith, said second latching member having a lower cammed surface and an upper relatively wide surface cooperating with the underside of said lid for preventing the second latch from turning with respect to said rod and said meter lid,

a spring biasing means positioned about the other leg of said second U-shaped rod for normally biasing said second locking rod and said second latch into engagement with said side wall enclosure to thereby lock said meter box lid in a closed position and for biasing said second locking rod and said second latch toward said side wall enclosure when said second latch and said second rod are moved against said bias to free said second latch from said side wall enclosure.

3,921,450
SURFACE LEVEL MEASURING DEVICE

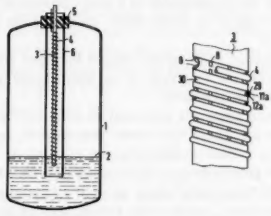
Karl Pfister, Nurnberg, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Feb. 13, 1974, Ser. No. 442,134

Claims priority, application Germany, Feb. 22, 1973, 2308823

Int. Cl.² G01F *23/22*

U.S. Cl. 73—295 **5 Claims**



1. Surface level measuring device comprising a measuring sensor heatable to a given temperature and insertable into a liquid, the surface level of which is to be measured, whereby the given temperature of said measuring sensor is changed, and means for determining the surface level of the liquid in accordance with the change in the given temperature, said measuring sensor comprising a sheathed conductor formed with a resistance wire having a temperature-dependent resistance and a heating wire distinct from said resistance wire traversible by an electric current, and a support rod having projections extending therefrom, said sheathed conductor being wound around said support rod in engagement with said projections.

3,921,451
APPARATUS FOR ELECTRICAL INSPECTION OF INACCESSIBLE ELEMENTS

Sebastian F. Di Giacomo, Merrick, N.Y., assignor to Gull Airborne Instruments, Inc., New York, N.Y.

Division of Ser. No. 237,718, March 24, 1972, Pat. No. 3,798,515. This application Jan. 2, 1974, Ser. No. 429,554

Int. Cl.² G01F *23/26*; G01R *31/04*

U.S. Cl. 73—304 C **6 Claims**

1. Apparatus for measuring a fluid in a tank, comprising:

a. fluid level sensing capacitor means mounted in the tank, including conductive plate elements extending substantially throughout the vertical dimension of the tank and separated by space open to fluid in the tank so that the dielectric between the plate elements and hence the capacitance of the capacitor means varies with the fluid level and the dielectric constant;

b. compensating capacitor means mounted in the tank at substantially the lowest level therein, said compensating capacitor means comprising spaced conductive plate elements, the space between said elements being open to the fluid in the tank so that the capacitance of said compensating capacitor means varies only with variations in the dielectric constant of the fluid in the tank;

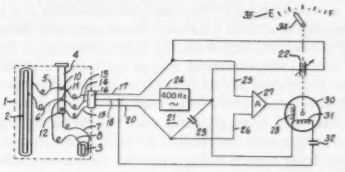
c. indicating circuit means outside the tank;

d. an electrical connector fixed in a wall of said tank;

e. electrical conductor means extending between said electrical connector and said indicating circuit means; and

f. fault isolation probe means, including:

1. an elongated support insertable and removable through an opening in the tank;



2. closure means for the opening attached to the support;

3. plurality of terminals mounted on the support; and

g. slack electrical conductors connecting the terminals on the support to the electrical conductor means on the electrical connector and to the respective plate elements of the liquid level sensing capacitor means and the compensating capacitor means, said conductors being sufficiently slack to permit withdrawal of the probe support and terminals through said opening to permit electrical testing of the capacitor means through said conductors without withdrawing the capacitor means from the tank.

3,921,452
CONTINUOUS TEMPERATURE MEASURING SYSTEM FOR METALLURGICAL FURNACES

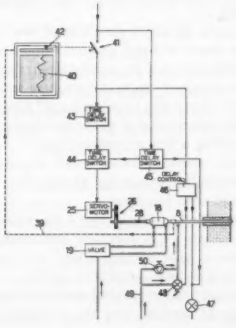
Guy Sartorius, Ban-Saint-Martin, France, assignor to Societe des Aciers Fins de l'Est, Boulogne-Billancourt, France

Filed June 12, 1973, Ser. No. 369,356

Claims priority, application France, June 16, 1972, 72.21944

Int. Cl.² G01K *1/14, 7/04*

U.S. Cl. 73—343.5 **8 Claims**



1. A system for continuously measuring temperature variations in a chamber employed for melting metals comprising a shielded thermocouple having its hot end disposed in one end of an elongated measuring rod mounted for movement into said chamber through an aperture in a wall there of to obtain the temperature measurement, first driven displacement

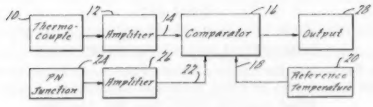
means connected to said measuring rod and operable to continuously impart longitudinal reciprocating translatory movement thereto to alternately move said rod between an extended position in which said one end of said rod penetrates inside said chamber and a retracted position in which said one end is withdrawn into said wall to remove any slag from the inner end of said aperture, at least one outlet orifice in the end of said tubular casing adjacent said hot end of said thermocouple whereby a cooling fluid is discharged from said casing at a position to cool slag collected on said inner end of said aperture to thereby facilitate removal of the slag by said measuring rod upon movement into said chamber, and second driven displacement means connected to said measuring rod and responsive to the temperature measured by said thermocouple to automatically withdraw said measuring rod a predetermined distance into said wall when said temperature exceeds a predetermined level for a predetermined time, said second driven displacement means including a temperature recorder connected to said thermocouple, a servo-mechanism controlled by said temperature recorder through a first time delay switch and drivingly connected to said measuring rod to produce withdrawal movement of said measuring rod, said first time delay switch being operable to prevent said servo-mechanism from operating until a predetermined temperature is exceeded for a predetermined time.

3,921,453

THERMOCOUPLE SYSTEM HAVING A PN JUNCTION FOR COLD JUNCTION COMPENSATION

George E. Platzer, Jr., Southfield, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 8, 1974, Ser. No. 449,313
Int. Cl.² G01K 7/12, 1/14
U.S. Cl. 73—361 **8 Claims**



1. A solid state thermocouple actuated electronic switch circuit with solid state cold junction compensation, said circuit comprising:

a thermocouple having a junction of two dissimilar metals with each metal being a current conducting member;

a first amplifier having its input terminals electrically connected respectively to said current conducting members of said thermocouple forming a cold junction and responsive to the voltage signal generated by said thermocouple for generating a first amplifier signal;

a solid state, semiconductor cold junction compensator means generating a voltage responding to the temperature of said cold junction;

a second amplifier having its input electrically connected to said solid state cold junction compensator means and responsive to said voltage signal generated thereby for generating a second amplified signal;

a reference temperature signal generator means generating a third signal representing the actuating temperature of the switch circuit;

a summing-comparator responsive to the summation of said first, second and third signals for generating a fourth signal whenever the magnitude summation of said first and second signal exceeds the magnitude of said third signal; and

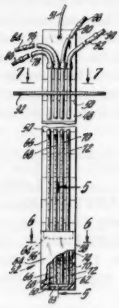
a solid state switching means responsive to said fourth signal for changing its state of conduction.

3,921,454

MULTI-INDICATING VACUUM GAUGE

Sterling B. Reames, IV, 255-19 147th Drive, Rosedale, N.Y. 11422

Filed Apr. 2, 1974, Ser. No. 457,362
Int. Cl.² G01M 15/00
U.S. Cl. 73—401 **16 Claims**



1. A multi-indicating vacuum gauge for use in synchronizing the output of the carburetors of a four carburetor motorcycle engine with respect to each other, said vacuum gauge comprising:

a. an elongated, calibrated support member adapted to be hung freely on a portion of the motorcycle in a substantially vertical position;

b. a common reservoir mounted on said calibrated support member proximate the lower end thereof, said reservoir including a base wall having an elongated, transversely oriented groove formed in the upper surface thereof, said reservoir being adapted to receive a supply of mercury;

c. four elongated tubes each having a bore therethrough, each said tube including upper and lower ends and an intermediate portion, said lower end of each said tube being positioned within said common reservoir below the upper level of the mercury therein with the lower ends of said tubes being positioned on the upper surface of said base wall whereby said bores in said tubes are in opposition to and in fluid communication with said groove said intermediate portion of each said tube being positioned in opposition to said calibrated support member; and

d. four elongated conduits each having a first end secured to an upper end of one of said tubes, the second end of each said conduit being adapted to be secured to one of the carburetors whereby, when the engine of the motorcycle is running the vacuum created in the carburetors will raise the mercury in said reservoir to a particular level in each said tube, which levels can be made substantially equal by adjusting the carburetors with respect to each other.

3,921,455

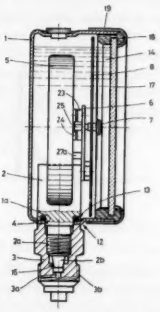
MANOMETER

Alfons Staubli, Jegenstorf, and Hans Weber, Zollikofen, both of Switzerland, assignors to Haenni & Cie Aktiengesellschaft, Jegenstorf, Switzerland

Filed Apr. 2, 1974, Ser. No. 457,264
Claims priority, application Switzerland, Apr. 9, 1973, 5070/73
Int. Cl.² G01L 7/04
U.S. Cl. 73—418 **5 Claims**

1. A manometer comprising a case including a case body having a cup-shaped sheet-metal part and having an aperture and an outward protrusion with a flat wall zone surrounding the aperture, a support piece including a prismatic portion arranged within the case, and ending at a shoulder which rests

on said flat wall zone, the contour of which is adapted to the outer contour of the shoulder, said support piece also including an outer portion extending from said prismatic portion at said shoulder through said aperture, an outer connecting piece having a bore and fitted in a fluid-tight manner to the outer portion of the support piece and firmly engaging said flat wall zone of the case body, a fluid-pressure measuring spring tube

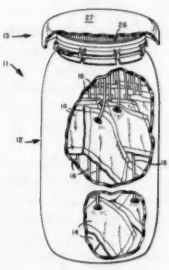


having a free end and an end secured to the prismatic portion of the support piece and an inner space connected with the bore of the outer connecting piece through a passageway provided in the support piece, and means arranged within the case, supported by the prismatic portion of the support piece and operatively connected to the free end of said fluid-pressure measuring spring tube, for indicating the measured fluid-pressure acting in that tube.

3,921,456
AIR QUALITY SAMPLER

Gilbert S. Newcomb, Jr., Los Altos, and Leon V. Langan, Jr., San Francisco, both of Calif., assignors to Environmental Measurements, Inc., San Francisco, Calif.

Filed Jan. 14, 1974, Ser. No. 433,273
Int. Cl.² G01N *1/24*
U.S. Cl. 73—421.5 R **10 Claims**

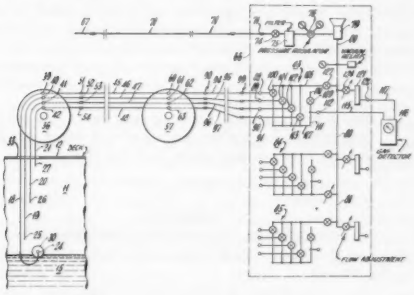


1. A gas sampler comprising a plurality of gas sample containers; a plurality of generally constant flow pumps, the output of each one of which is communicably connected with an associated one of said containers for respectively directing a quantity of the gas to be sampled into each of the containers; and control means connectable with said pumps for governing when each of said pumps direects a gas sample into its associated container, said control means activating each of said pumps to direct a gas sample into its associated container during a discrete time interval selected especially for said container and including flow rate selection means for determining the rate of flow of gas into said containers, said flow rate selection means being adapted to operate each of said pumps intermittently at its generally constant operating flow rate during the full time interval selected for each of said containers to thereby provide an average flow rate over the full time interval which is less than the continuous operating flow rate of said pump while still obtaining a gas sample representative of the gas over said full time interval; and said flow rate selection means being adjustable to vary the period of said intermittent operation of said pumping means during the time interval selected for each of said containers and thereby provide a selected one of a plurality of differing average flow rates for said pumping means.

3,921,457
SYSTEM FOR MONITORING THE ATMOSPHERE IN PETROLEUM PRODUCT TANKS

Vernon M. Barnes, Jr.; Kenneth M. Gunn, and Carlton M. Slough, all of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,900
Int. Cl.² G01N *1/26*
U.S. Cl. 73—421.5 R **6 Claims**



1. A system for monitoring the atmosphere in petroleum product tanks, comprising in combination

a plurality of flexible tubes having open ends,

means for supporting said tubes with said open ends at different levels in the atmosphere inside a tank,

means for applying a reduced pressure to the other ends of said tubes for drawing samples of said atmosphere into said open ends, and

means for connecting a gas detector in series with one or more of said tubes and said reduced pressure means for detecting undesirable conditions of said samples.

3,921,458
ISOKINETIC SAMPLING PROBE

Forrest E. Logan, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

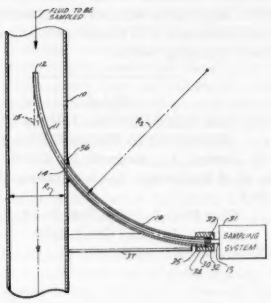
Filed Mar. 1, 1974, Ser. No. 447,212
Int. Cl.² G01N *1/22*
U.S. Cl. 73—422 R **6 Claims**

1. Apparatus for sampling the composition of a fluid flowing through a conduit which comprises:

a. a circularly arcuate hollow probe having a first open end to be disposed outside said conduit for attachment to a fluid sampling means; a second open end to be disposed within said conduit at a substantial distance from the point of entry of said probe into said conduit, at approximately the center line of said conduit and in a plane transverse to the path of fluid flow, said probe having along the circularly arcuate length thereof means to limit the extension of said probe into said conduit;

b. a circularly arcuate hollow sleeve for closely surrounding and preventing rotation of said probe in said conduit, said sleeve having one end for external attachment to said conduit about the point of entry of said probe into said conduit and a second end to receive said probe in slidable

relation, said second end for cooperation with the means on said probe to limit the extension of said probe into said conduit;



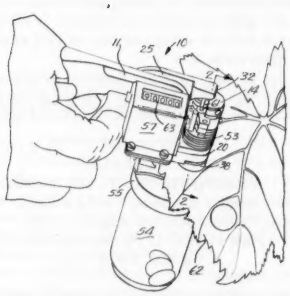
c. means to secure said probe to said sleeve and provide a fluid tight seal at the second end of said sleeve, to prevent leakage between said probe and said sleeve.

3,921,459

PRECISION LEAF SAMPLING DEVICE

Norman F. Willett, 1334 Monroe Bay Ave., Colonial Beach, Va. 22443

Filed Oct. 9, 1974, Ser. No. 513,227
Int. Cl.² G01N *1/08*
U.S. Cl. 73—425.2 **5 Claims**



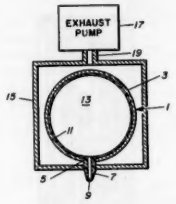
1. A precision leaf sampling device comprising a chassis, a lever pivotally mounted on said chassis, a handle on said chassis, a second handle on said lever with said lever pivoted on said chassis as said handles are squeezed together, a specimen jar detachably connected to said chassis at the lower end thereof, a circular cutter supported on said chassis above said specimen jar and have an opening extending therethrough communicating with said specimen jar, an anvil mounted for vertical movement on said chassis for cooperative cutting action with said cutter, and means on said lever cooperating with said anvil for moving said anvil vertically with respect to said cutter to cut a specimen and move the specimen into said specimen jar.

3,921,460

PRECISION LIQUID-HANDLING INSTRUMENT

Albertus E. Schmidlin, 28 Highview Road, Caldwell, N.J. 07006

Filed Sept. 6, 1974, Ser. No. 504,004
Int. Cl.² B01L *3/02*
U.S. Cl. 73—425.6 **8 Claims**



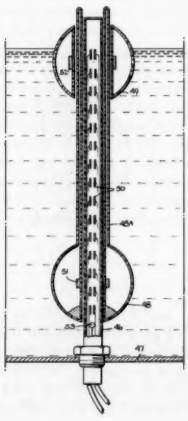
1. A precision instrument comprising: a chamber having walls that are impervious to liquids except for an open entrance bore of small diameter, the entire inner surface of said walls being formed of a non-wetting material, at least a portion of said walls being pervious to gases; whereby gases can be removed from a liquid within said chamber by subjecting the outer surface of said wall portion to a partial vacuum; said wall portion being made of a porous metal having a thin gas-pervious inner layer of a polyfluorohydrocarbon resin bonded thereto.

3,921,461

DIFFERENTIAL HYDROMETER ASSEMBLY

Howard M. Layton, P.O. Box 450, Salem Road, Pound Ridge, N.Y. 10576

Filed May 15, 1974, Ser. No. 470,322
Int. Cl.² G01N *9/10*
U.S. Cl. 73—447 **5 Claims**



1. A differential hydrometer assembly adapted to generate an electrical signal whose value is a function of the specific gravity of liquid within a tank, the level of the liquid being subject to change, said assembly comprising:

A. a guide stem anchored in the bottom of said tank and extending upwardly therefrom to a height above the highest level of said liquid;

B. a weighted float fully immersible in said liquid, said float having an opening therein through which said stem extends to permit said float to ride freely on said stem;

C. a first transducer having an element disposed within said stem and a cooperating element disposed within said weighted float to produce a first output that depends on the relative position of said elements and is a function of the specific gravity;

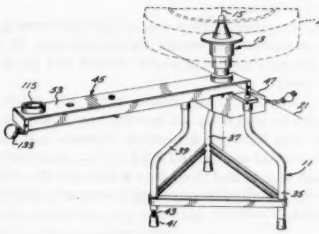
D. a reference float in said liquid having a greater buoyancy than said weighted float, whereby said reference float always remains somewhat above the surface of said liquid regardless of its level in the tank, and

E. a second transducer coupled to said reference float to produce a second output which depends on the liquid level, said first output being combined with said second output to provide a specific gravity indication independent of liquid level.

3,921,462
ROTARY BALANCER

Floyd S. Hamer, 3930 Bouton Drive, Lakewood, Calif. 90712

Continuation of Ser. No. 285,301, Aug. 31, 1972, abandoned.
This application Nov. 1, 1973, Ser. No. 411,660
Int. Cl.² G01M *1/08, 1/12, 1/16*
U.S. Cl. 73—482 **15 Claims**



1. A low speed rotary balancer for detecting unbalance of a work piece and comprising:

a stand;

spindle means including a receiver for receiving, supporting and centering said work piece;

means mounting the spindle means for rotation about a vertical axis;

horizontal tilting axle means attached to the mounting means at a point below said spindle means;

bearing means mounting said axle means from said stand for free tilting of said spindle means about said horizontal tilting axle means

an amplifier arm connected on one end to said mounting means and projecting horizontally therefrom in one direction to form a free end;

weight means disposed on opposite sides of said horizontal axle for normally urging said spindle towards its centered position;

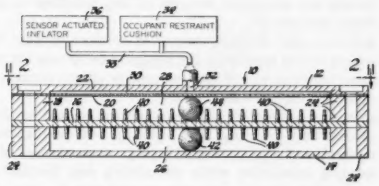
vibration means for vibrating said balancer to minimize frictional resistance; and

indicator means coupled with the free end of said arm to indicate vertical travel thereof whereby said unbalanced work piece may be placed on said receiver and said work piece rotated slowly to rotate said spindle means to cause said spindle means to teeter about said horizontal axle, thereby moving the free end of said arm to actuate said indicator to a degree dictated by the magnitude by which said work piece is out of balance.

3,921,463
COLLISION RECORDER

Samuel B. Robbins, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1972, Ser. No. 305,868
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² G01P *15/04*
U.S. Cl. 73—492 **6 Claims**



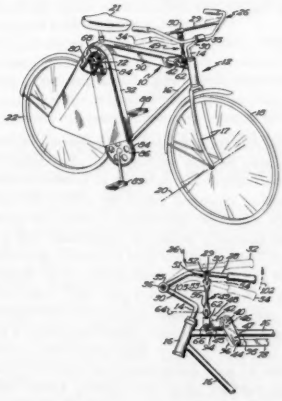
1. A collision recorder comprising a planar member, a plurality of discrete frangible means carried by the planar member and an inertia mass movable on the planar member, said discrete frangible means being positioned on said planar member to surround the inertia mass, the inertia mass moving and serially breaking said surrounding frangible means when subjected to a predetermined impact induced deceleration force whereby the path of movement of the inertia mass through the frangible means indicates the direction of impact and the number of frangible means broken during such movement indicates the magnitude of the deceleration force.

2. A collision recorder for an occupant restraint system, said collision recorder comprising, a planar member, a plurality of spaced frangible means carried by the planar member, an inertia mass movable on the planar member and surrounded by the plurality of frangible means, the inertia mass moving and breaking the frangible means when subjected to a predetermined deceleration force, and means for capturing the inertia mass upon actuation of the occupant restraint system.

3,921,464
HANDLEBAR DRIVEN BICYCLE

Theodore S. Greseth, Rte. 2, Dawson, Minn. 56232

Filed Oct. 12, 1973, Ser. No. 405,862
Int. Cl. F16h *19/05*
U.S. Cl. 74—37 **5 Claims**



1. In combination with a bicycle having a frame, a steering post pivotally mounted to said frame for steering movement

about a generally upright axis, a front wheel rotatably mounted to said steering post, and a rear wheel rotatably mounted to said frame, and improved driving apparatus comprising:

an integral handlebar pivotally mounted to said steering post for upward and downward swinging movement about a generally horizontal axis, said integral handlebar including left and right handgripping sections extending outwardly from said steering post and stationary relative to one another so that an operator may apply his full weight to said left and right sections of said handlbar in urging them downwardly;

a follower arm pivotally mounted relative to said frame adjacent said handlebar for swinging reciprocating movement between raised and lowered positions about a generally horizontal axis;

means interconnecting said follower arm to said handlebar, raising and lowering said follower arm in response to upward and downward swinging, respectively, of said integral handlebar while permitting said handlebar to move with said steering post as said steering post pivots about said generally upright axis;

mechanical linkage drivingly connecting said follower arm to said rear wheel and rotatably driving said rear wheel in response to upward and downward reciprocating movement of said follower arm generated by swinging movement of said integral handlebar about said generally horizontal axis by an operator to propel the bicycle; and

a spring biasing said follower arm toward raised position.

3,921,465

APPARATUS FOR CONVERTING ROTARY TO LINEAR RECIPROCATING MOTION WITH A DECELERATED PORTION IN ITS STROKE

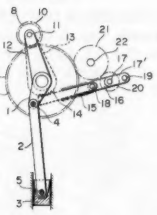
Toru Hosoda, Zama, and Mitsuru Seki, Sagamihara, both of Japan, assignors to Nissan Motor Company Limited, Japan

Filed Mar. 6, 1974, Ser. No. 448,635

Claims priority, application Japan, Mar. 10, 1973, 48-27623

Int. Cl.[2] F16H *21/32*

U.S. Cl. 74—52 **4 Claims**



1. An apparatus for generating a reciprocating motion having a decelerated portion within its stroke, comprising:

an input shaft driven in operation at a constant speed, a gear drive means arranged coaxially with said input shaft, a rotatably mounted crankshaft, a first sun gear arranged rotatably coaxially with said crankshaft and in mesh with said gear drive means, a first planetary gear meshing with said first sun gear, an intermediate shaft rigidly mounting thereon said first planetary gear and a second planetary gear, a second sun gear secured to said crankshaft and meshing with said second planetary gear, a reciprocally driven slider driven by said crankshaft, a sector gear supported by said crankshaft and rockably connected to said intermediate shaft and having teeth formed at the end thereof nearest to said crankshaft, means mounted on said crankshaft supporting said intermediate shaft, a gear rack engaged with the teeth of said sector gear, a crank secured to said input shaft for reciprocably driving said gear rack, whereby a decelerated portion is provided in the reciprocating motion of said slider by rocking of said sector gear around said crankshaft by said gear rack.

3,921,466

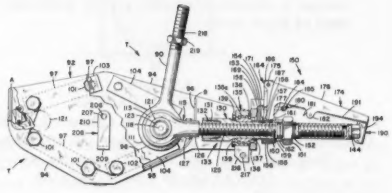
TRANSLATING DEVICE

Harvey C. Allsup, Jr., Fort Worth, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Division of Ser. No. 346,562, March 30, 1973, Pat. No. 3,858,523. This application Aug. 23, 1974, Ser. No. 499,819

Int. Cl.[2] F16H *21/54;* B61F *9/00*

U.S. Cl. 74—110 **7 Claims**



1. A motion translating device including:

a body mountable on a base structure for pivotal movement about a first axis;

an input member and an output member having first and second connecting means connecting them to said body for pivotal movement about second and third axes, respectively;

one of said connecting means being adjustably movable relative to said body for moving one of said second and third axes between a position wherein said first axis is between said second and third and a position wherein one of said second and third axes is between the other of said second and third axes and said first axis, said axes being parallel.

3,921,467

DRIVE SYSTEM FOR CYCLE

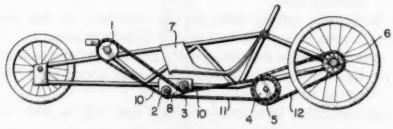
Hideji Matsuura, Suite 505, 17-17 Mita 4-chome, Minato, Tokyo, Japan

Filed Mar. 11, 1974, Ser. No. 450,174

Claims priority, application Japan, June 9, 1973, 48-64939

Int. Cl.[2] F16H *7/00;* B62M *1/02;* B62K *1/00*

U.S. Cl. 74—219 **3 Claims**



1. In a cycle having a body, pedal means mounted on said body, and at least one rear drive wheel means the improvement comprising a drive means including:

a. primary sprocket means mounted on said pedal means;

b. final sprocket means mounted on said rear drive wheel means;

c. chain means having an upper and lower portion coupling said primary and final sprocket means; and

d. tensioner sprocket means mounted on said body comprising two adjustable sprocket wheels positioned between said primary and final sprocket means, one of said sprocket wheels engaging said upper portion of said chain means and the other of said sprocket wheels engaging the

lower portion of said chain means, wherein said sprocket wheels can be adjusted to adjust the tension of said chain means; and,

wherein said primary and tensioner sprocket means are positioned along the center line of said body.

3,921,468

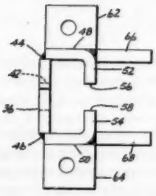
CHAIN GUIDE FOR USE IN A HEAT TREATING OVEN OR THE LIKE AND METHOD OF MANUFACTURE

Joseph D. Wright, 209 W. Ohio St., Kendallville, Ind. 46755

Filed Dec. 20, 1974, Ser. No. 535,038

Int. Cl.² F16H *7/18*

U.S. Cl. 74—240 **5 Claims**



1. The improvement in chain guide apparatus for enclosing a driving chain carrying a driving member in a high temperature environment comprising,

a relatively nonporous, homogeneous elongated base plate, said base plate having a lateral dimension greater than the width of the driving chain,

a relatively nonporous, homogeneous first guide member having a longitudinal dimension corresponding to said base plate longitudinal dimension and being welded to one of said base plate longitudinal edges,

said first guide member having a first guide wall upstanding from said base plate a distance corresponding to the driving chain height,

a first guide flange being formed integrally with said first guide wall and having a longitudinal dimension corresponding to said first guide wall longitudinal dimension and being substantially orthogonal to said first guide wall to overlie said base plate,

a relatively nonporous, homogeneous second guide member having a longitudinal dimension corresponding to said base plate longitudinal dimension and being welded to the other of said base plate longitudinal edges,

said second guide member having a second guide wall upstanding from said base plate a distance corresponding to the driving chain height,

a second guide flange being formed integrally with said second guide wall and having a longitudinal dimension corresponding to said second guide wall longitudinal dimension and being substantially orthogonal to said second guide wall to overlie said base plate, thereby forming a chain enclosure,

the longitudinal edges of said first and second flanges being spaced apart a predetermined distance to form a longitudinal guide slot adapted to receive and guide said chain driving member.

3,921,469

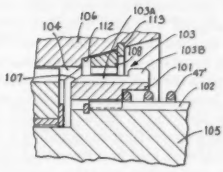
TRANSMISSION WITH RESILIENTLY LOADED MAIN SHAFT GEARS

Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 276,376, July 31, 1972, Pat. No. 3,799,002. This application Mar. 20, 1974, Ser. No. 452,825

Int. Cl.² F16H *3/38;* **F16D** *13/00, 21/02*

U.S. Cl. 74—339 **6 Claims**



1. In an interengageable jaw clutch system the combination comprising:

first rotatable means and a first jaw clutch portion mounted thereon for axial sliding relationship therewith and positive rotation therewith about an axis;

second rotatable means coaxially related to said first means and a second jaw clutch portion arranged thereon for interengagement with said first jaw clutch portion upon relative axial movement of said jaw clutch portions toward one another;

one of said jaw clutch portions having drive teeth at a radius suitable for engaging with clutch teeth on the other jaw clutch portion, said one clutch portion having also blocking teeth projecting radially beyond and axially offset from said drive teeth;

blocker means coacting between said first and second jaw clutch portions for positively preventing engagement of said jaw clutch portions so long as a substantial difference in relative speed exists therebetween, said blocker means including an annular blocker having blocking portions arranged on and supported by said drive teeth for limited rotation with respect thereto and positioned axially between said blocking teeth and said clutch teeth when said jaw clutch portions are disengaged, some of said blocking teeth being provided with spaces therebetween capable of receiving therein said blocking portions when said blocking portions and said spaces are axially aligned to permit said blocking portions to relatively move axially past said blocking teeth so that said jaw clutch portions can be engaged with one another; and

a surface on said blocker frictionally cooperating with a surface on said other jaw clutch portion for circumferentially offsetting said blocker with respect to said one jaw clutch portion whenever and for so long as a substantial difference in relative rotative speeds exist between said respective jaw clutch portions, said blocking portions interfering with said blocking teeth when said blocker is circumferentially offset so as to prevent engagement of said jaw clutch portions.

6. An interengageable clutch system, comprising:

first jaw clutch means supported for rotation about an axis, said first jaw clutch means including an annular peripheral surface and a set of first clutch teeth projecting radially therefrom;

second jaw clutch means coaxially aligned with said first jaw clutch means and supported for rotation about said axis, said second jaw clutch means including a set of second clutch teeth projecting radially therefrom, said first and second clutch teeth projecting radially in opposite directions and being sized to meshingly engage with one another;

means for effecting relative axial shifting of said first and second jaw clutch means between a first position wherein

said first and second clutch teeth are in a disengaged and axially spaced relation and a second position wherein said first and second clutch teeth are meshingly engaged;

blocking means coacting between said first and second jaw clutch means for preventing same from being shifted into said second position so long as a substantial difference exists in the rotational speed between said first and second jaw clutch means, said blocking means including a set of blocking teeth fixedly associated with said first jaw clutch means and projecting radially from the peripheral surface associated therewith, said blocking teeth being axially aligned with said first clutch teeth and projecting radially beyond the free ends of said first clutch teeth so that said blocking teeth have a radial dimension which is greater than the radial dimension of said first clutch teeth, and at least one of said blocking teeth being at least partially removed to define a space;

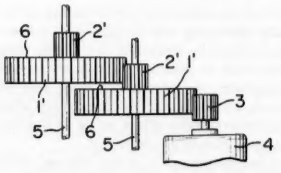
said blocking means further including a ring-shaped blocker concentric with said first jaw clutch means and supported thereon, and means coacting between said blocker and said first jaw clutch means for permitting limited rotation therebetween, said blocker also being axially slidable relative to said first jaw clutch means and having a blocking portion projecting therefrom adapted for slidable reception within said space when said first and second jaw clutch means are shifted into said second position, said locking portion having a part thereof positioned to interfere with said blocking teeth and prevent said first and second jaw clutch means from being shifted into said second position when said blocker is circumferentially offset with respect to said first jaw clutch means due to a substantial difference existing in the rotative speeds between said first and second jaw clutch means; and

said blocker and said second jaw clutch means having opposed, tapered annular surfaces which frictionally cooperate with one another to reduce the relative rotational speed between said first and second jaw clutch means when they are being relatively shifted toward said second position.

3,921,470
GEAR ASSEMBLY

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed May 31, 1974, Ser. No. 475,099
Claims priority, application Japan, 48-65724
Int. Cl.² F16H 1/06
U.S. Cl. 74—414 **7 Claims**

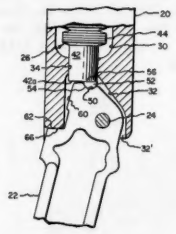


1. A low module gear assembly comprising a first molded gear and a second gear, said first gear having a width dimension defined by two axially spaced apart transverse edges wherein at least one transverse edge has a flash formed thereon during the molding process, and said second gear meshes operatively only with that portion of the width dimension of said first gear that does not have said flash thereon and said entire second gear is axially spaced from said transverse edge of said first gear having said flash thereon.

3,921,471
OVERLOAD PREVENTION HANDLE

Burton H. Smith, Grand Island, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Jan. 10, 1975, Ser. No. 540,004
Int. Cl.² G05G 1/04; B25B 23/142
U.S. Cl. 74—523 **3 Claims**

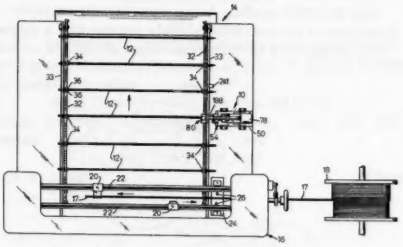


1. In a handle for preventing overloading of a handle operated mechanism by undergoing a change in shape upon application of a predetermined mechanism operating force thereto, wherein the handle includes an elongated main body portion having one end thereof adapted for operable connection to said mechanism for rotation about a first axis extending transversely of said body portion, an extension portion to which mechanism operating forces are to be applied, pivot shaft means for mounting said extension portion on another end of said body portion for relative pivotal movement about a second axis arranged essentially parallel to said first axis, and constraining means for normally maintaining said extension portion in a normal mechanism operating position in substantial alignment with said body portion while releasing said extension portion for pivotal movement about said second axis away from said normal position into an overload position upon application of said predetermined operating force thereto, said constraining means tending to return said extension portion to said normal position from said overload position upon removal of said predetermined operating force therefrom, said constraining means including a stack of spring discs and means for mounting said discs on said body portion, said mounting means including first and second members fixedly and movably mounted on said body portion, respectively, said second member having an end arranged for cooperative engagement by said extension portion, whereby said stack is compressed between said members to permit movement of said extension portion from said normal position when said predetermined operating force is applied to said extension portion; the improvement wherein said extension portion is formed with a concave recess opening towards said end of said second member, said recess being of partial cylindrically shaped configuration and having its axis disposed essentially parallel to said second axis, said end of said second member is an essentially planar surface and disposed transversely of the direction of movement of said second member relative to said body portion, and there is further provided a friction member formed with a partial cylindrically shaped bearing surface dimensioned to be partially received in surface to surface rotary frictional engagement within said recess and lengthwise extending planar bearing surface arranged in sliding face to face frictional engagement with said planar surface of said second member, whereby pivotal movement of said extension about said second axis results in simultaneous rotations of said friction member within said recess and sliding movements of said friction member across said planar surface of said second member.

3,921,472
ROTARY WIRE STRIPPER

Ragnar Gudmestad, West Allis, and Leon J. Gorski, New Berlin, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Mar. 12, 1975, Ser. No. 557,618
Int. Cl.² H02G 1/12
U.S. Cl. 81—9.51 **15 Claims**

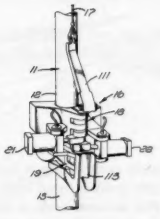


1. A rotary wire stripping machine comprising: a head member supported for movement between a first position spaced a predetermined distance from an end of a wire having insulation material thereon to a second position adjacent to said end of said wire, and for rotation about an axis in general alignment with the axis of said wire, said head member including a core having a chamber therein for receiving a predetermined part of the end of said wire when said head is in said second position, a pair of opposed blade members slidably supported in said core for rotation therewith and being movable radially with respect to said core, and an annular member surrounding and rotatably movable around said core and in respect thereto, said annular member having cam actuating means mounted thereon for forcing said blades to move radially inwardly in response to relative rotation of said core and annular member to engage and sever said insulation material at a point spaced from said end of said wire when said head is in said second position.

3,921,473
TOOL FOR MAKING AND BREAKING PIPE JOINTS

George I. Boyadjieff, Anaheim, and Andrew B. Campbell, San Marino, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Filed May 2, 1974, Ser. No. 466,199
Int. Cl.² B25B 13/50
U.S. Cl. 81—57.34 **20 Claims**



1. A tool for effecting relative rotation between two threaded pipes, comprising:

a first gripping assembly adapted to extend about and grip a first of said pipes, and including two jaws and a first hinge connection attaching said jaws together for relative swinging movement between open and closed positions;

a second gripping assembly adapted to extend about and grip a second of said pipes, and including two additional jaws and a second hinge connection attaching said additional jaws together for relative swinging movement between open and closed positions;

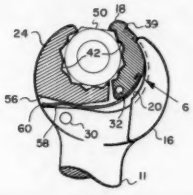
power operated actuating means operable to exert force for turning one of said gripping assemblies relative to the other about a common axis to effect relative rotation between the pipes; and

guide means carried by both of said jaws of each of said two gripping assemblies and operatively interfitting in a relation guiding the jaws of one assembly for rotary movement relative to corresponding jaws of the other assembly when moved by said actuating means in both of two opposite rotary directions.

3,921,474
RATCHET ACTION OPEN-END WRENCHES

Lloyd R. Dyck, Weston, and Alexander N. Openshaw, Concord, both of Canada, assignors to Aljac Devices Limited, Mississauga, Canada

Filed Apr. 25, 1974, Ser. No. 464,042
Int. Cl.² B25B 13/28
U.S. Cl. 81—91 B **13 Claims**



1. A ratchet-action open-ended wrench operable in a first mode in a torquing direction to drivingly rotate a fastener head fitting within the wrench end, and operable in a second mode in an opposite ratcheting direction to ratchet freely in resiliently secured relation about said head, comprising; an elongated handle with a backing jaw portion extending from one end thereof having a smoothly curved inner working surface terminating at an outer end; a first moveable jaw having at least two mutually inclined working faces located between an inner and an outer end of the jaw to drivingly contact mutually inclined faces of said head, and an obverse first jaw surface curved to fit in mating supported relation with said curved working surface of said backing jaw portion, in said first mode and an outer end abutment to seat on said backing jaw outer end; a second jaw attached at the inner end thereof in hinging relation to said first jaw inner end and pivotally secured to said handle end said second jaw having an outer end arcuately moveable in said second mode into opened co-operating relation with said first jaw outer end to receive a said fastener head therebetween; jaw biasing means to resiliently bias said first and second jaws in mutual closing relation to effect mating relation between working surfaces of said jaws and flat portions of said fastener head, when operated in said first mode, and to maintain said first and second jaws in head-engaging ratcheting relation on rotation of said wrench about said fastener head in said second mode, said backing jaw adjacent surface portion being inclined relative to said first jaw working faces to generate reaction forces with said first jaw, when in use in said first mode, to secure said first jaw obverse surface in pressing relation against said adjacent surface and said first jaw abutment pressing against said backing jaw outer end in circumferentially compressive torque transmitting relation therewith to preclude motion of said first jaw, thereby preventing motion of said second jaw in pivotting opening motion relative to said handle and said first jaw, said backing jaw curved inner surface portion co-operating with said first jaw, when operated in said second mode, to move said first jaw outwardly from said handle in unlocking relation

with said second jaw, to permit opening and said ratcheting motion thereof.

3,921,475

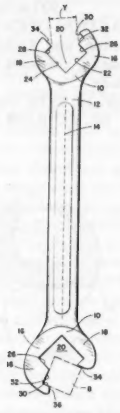
COMBINATION TORQUEING AND RATCHETING WRENCH FOR SQUARE MEMBERS

James P. Evans, 3233 SW. 23rd St., Oklahoma City, Okla. 73108

Filed Aug. 5, 1974, Ser. No. 494,569. The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² B25B *13/46, 13/02*

U.S. Cl. 81—119 **8 Claims**



1. A combination torqueing and ratcheting wrench for a square member in which the distance between opposing faces is X, comprising;

a body having a handle portion and spaced apart jaws, one of the jaws being a torqueing jaw and the other being a backup jaw, the jaws having at least portions of the four sides of a square member whereby a square member therein may be torqued by rotation of the handle relative to the member in either direction, the jaws having at the outer ends an open space therebetween of a width less than X, the torqueing jaw having at the outer end thereof, a notch formed of two intersecting surfaces, one being a torqueing surface and the other a positioning surface, the backup jaw having, at the outer end thereof, a backup surface the planes of the backup surface and torqueing surface being parallel each other and spaced apart a distance slightly greater than X, the length of the torqueing surface being less than ½ X.

3,921,476

COMBINATION TORQUEING AND RATCHETING WRENCH FOR IRREGULAR HEXAGONAL MEMBERS

James P. Evans, 3233 SW. 23rd St., Oklahoma City, Okla. 73108

Continuation-in-part of Ser. No. 418,549, Nov. 23, 1973, Pat. No. 3,850,057. This application Nov. 20, 1974, Ser. No. 525,298. The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² B25B *13/46*

U.S. Cl. 81—119 **8 Claims**

1. A combination torqueing and ratcheting wrench for an irregular hexagonal member in which the distance between opposing faces is Y and the length along a face is Z comprising:

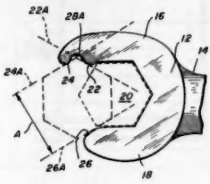
a body having a handle portion extending in one direction and spaced apart jaws in a different direction, one of the jaws being a torqueing jaw and the other being a backup jaw;

the space between the jaws being configured to engage at least portions of at least five sides of a hexagonal member whereby a hexagonal member therein may be torqued by rotation at the handle relative to the member in either direction;

the jaws having an open space between the outer ends;

the torqueing jaw having, at the outer end thereof, two surfaces, one of the surfaces being a torqueing surface and the other surface being a positioning surface;

a tangent of the torqueing surface intersecting a tangent of the positioning surface at an angle of 120°,



the backup jaw having, at the outer end thereof, a backup surface, a tangent at the backup surface being parallel said tangent of said torqueing surface, the parallel tangents being spaced apart slightly greater than Y,

the torqueing surface and positioning surface being condigured to engage the intersecting sides of one corner of a hexagonal member and the backup surface being configured to engage one side of an opposite corner of the hexagonal member whereby torque may be applied to the hexagonal member by rotation of the handle portion in one direction;

wherein the length of said tangent of said torqueing surface engaging a hexagonal member is less than ½ Z, and

wherein said torqueing surface and said backup surface has a recess at the intersection of the tangents thereof whereby a hexagonal member engaged by such surfaces is not contacted at the corner.

3,921,477

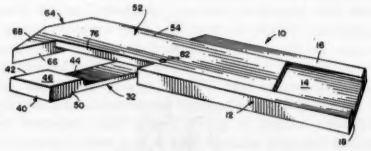
DEVICES WITH SLIDE-ACTION-ARTICULATED GRIPPING AND/OR CUTTING MEMBERS

Michael C. Wilson, Glen Ellyn, Ill., assignor to Plus Four, Inc., Wheaton, Ill.

Filed Oct. 18, 1974, Ser. No. 516,074

Int. Cl.² B25B *13/18*

U.S. Cl. 81—128 **2 Claims**



1. A hand wrench comprising a handle for said wrench having a longitudinal groove in an outer surface thereof, said groove having a flat bottom wall, a first slide bar having a wrench jaw head at one end thereof which projects beyond the handle, said first slide bar being slidably mounted in said longitudinal groove and having a flat face opposing said flat bottom wall, said handle having at one end thereof a second groove extending diagonally at an angle of 30° ± 5° to the longitudinal axis of said first slide bar, said second groove extending across and being deeper than said first groove, a second slide bar slidably mounted in said second groove, said second bar having a wrench jaw head at an end thereof which projects beyond said handle, said first bar sliding over said

second bar, said flat face of said first bar having a straight slot extending diagonally therein substantially at a right angle relative to said second groove, said second bar having a pin projecting into and slidably riding in said slot, and the first bar having an exposed side adapted for thumb engagement for imparting longitudinal sliding movement thereof in said handle to articulate movement of said first and second jaw bearing members simultaneously toward or away from said end of said handle.

3,921,478

TOOL, SUCH AS A PAIR OF PLIERS OR SCISSORS

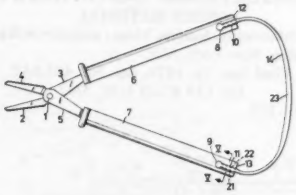
Göran Ygfors, Vallingby, Sweden, assignor to Ygfors Trading AB, Jarfalla, Sweden

Filed Dec. 30, 1974, Ser. No. 537,115

Claims priority, application Sweden, Jan. 18, 1974, 74006800

Int. Cl.² B25B 7/02

U.S. Cl. 81—417 **3 Claims**



1. A tool, such as a pair of pliers or scissors, with shanks jointed by a pivot, said shanks forming jaws and handle portions, each of said handle portions carrying a handle, between the outer ends of which a spring band of a plastic material is removably arranged and working to keep the tool jaws open, said handles at their outer ends being provided with a substantially cylindrical hole parallel to said pivot, and a guiding slot extending from each of said holes and slots to the outer end surfaces of each respective handle to receive said spring band, the ends of said band having the shape of substantially cylindrical beads and having a part adjacent to the beads with a thickness corresponding to the widths of said guiding slots, said beads and adjacent parts of the spring band being inserted in the hole and guiding slots of each handle, said slots keeping the spring band bent in arc form in the longitudinal direction thereof between the handles.

3,921,479

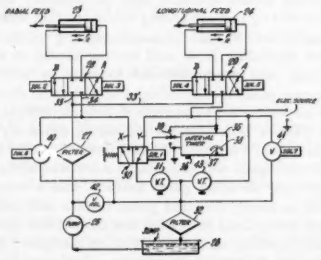
FEED MECHANISM FOR AN END-BEVEL MACHINE

Lyber Katz, Bronx, N.Y., assignor to Tubeco, Inc., Brooklyn, N.Y.

Filed Feb. 22, 1974, Ser. No. 444,775

Int. Cl.² B23B 5/36, 5/38

U.S. Cl. 82—21 A **9 Claims**



1. In a machine of the character indicated, work-holding means, tool-holding means, and two-component feed means for two-component relative movement of said holding means, each feed component of said feed means comprising its own independent motion-displacement mechanism, cycle-dividing control means having means for the selected division of the cycle thereof into a first timed fraction having a selected relation to the remaining timed fraction of the cycle, and independent control connections from said control means to each of the respective component motion-displacement mechanisms such that the timed control of said mechanisms is in accordance with the selected fractional sharing of the cycle of said control means, whereby the resultant displacement is a function of the selection of cycle division.

3,921,480

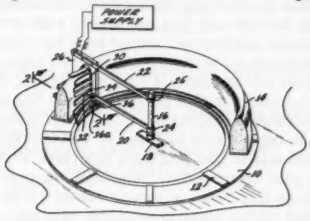
FORM GENERATOR FOR CELLULAR MATERIALS

Charles W. Ball, Spring Valley, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sept. 12, 1974, Ser. No. 505,465

Int. Cl.² B26F 3/12

U.S. Cl. 83—1 **6 Claims**



1. Form generator for cellular materials which comprises shaft means connected to a table, form means connected to said shaft means and adapted for pivotal movement about said shaft means, said form means having formed therein an opening of a contour designed to produce a part of the desired profile, and cutting means employed in said opening and similar in shape to said opening, said cutting means active on a blank of said cellular material to reduce it to the desired shape.

3,921,481

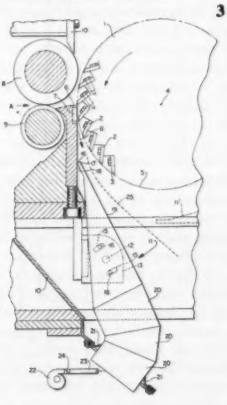
WEB SEVERING DEVICE

Joel Marcus, 6861 Yellowstone Blvd., Forest Hills, N.Y. 11375

Filed May 13, 1974, Ser. No. 469,287

Int. Cl.² B26D 1/36, 1/40, 7/18

U.S. Cl. 83—117 **3 Claims**



1. Apparatus for severing a web of paper comprising a cutting cylinder and a folding cylinder, said folding and

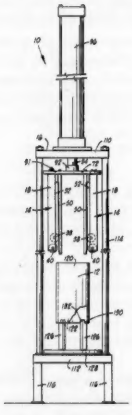
cutting cylinders being in close proximity to each other with there being a slight clearance therebetween, said cutting cylinder including a female indentation having first and second opposed sides and a base, a knife box mechanism located in said indentation, said knife box mechanism including a first knife box piece and a second knife box piece, said first knife box piece including a side which is flush with a first opposed side of said female indentation, said first knife box piece further including a base having a bottom surface which is flush with a portion of the base of said female indentation, said first knife box piece further including an overhang extending perpendicularly away from said side thereof towards said second opposed side of said female indentation, said second knife box piece including a side that is flush with said second opposed side of said female indentation, said second knife box piece further including a base having a bottom surface flush with a portion of said female indentation base, said second knife box piece including an overhang which extends perpendicularly away from said side of said second knife box piece, the bases of said first and second knife box pieces being spaced from each other, a bolt extending through said first and second knife box pieces and maintaining said first and second knife box pieces in spaced apart relationship with each other, a first rubber cheek having a base and an extended portion, a shoulder between said base and said extended portion and said first rubber cheek base including an upper surface, said base of said first rubber cheek in contact with said base of said first knife box piece and said side of said first knife box piece, said first rubber cheek base upper surface contacting the overhang of said first knife box piece, a second rubber cheek identical to said first rubber cheek cooperating with said second knife box piece in the same manner that said first rubber cheek cooperates with said first knife box piece, said first and second cheeks being spaced from each other, a cutting knife being located between said first and second rubber cheeks and extending outwardly therefrom and said first and second rubber cheeks having a durometer hardness of 65 plus or minus 5.

3,921,482

PIPE SLITTER APPARATUS

Jack S. Osborn, Tulsa, Okla., assignor to Ree-Born Industries, Tulsa, Okla.

Filed Aug. 16, 1974, Ser. No. 497,939
Int. Cl.² B26D 1/18
U.S. Cl. 83—185 **10 Claims**



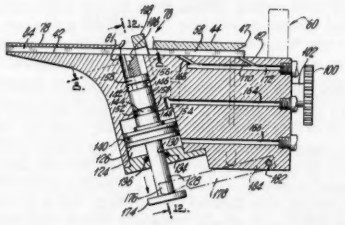
1. Apparatus for slitting pipe wall, comprising:
a slitter assembly characterized as comprising:
a first base member;
a blade holder supported by the first base member;
a backup member supported by the first base member and forming with the blade holder a pipe wall receiving channel;
a first cutter blade supported on the blade holder disposed to extend across the pipe wall receiving channel; and
a second cutter blade supported by the blade holder in cutting alignment with the first cutter blade, the second cutter blade disposed in the pipe wall receiving channel and extending partially across the pipe wall receiving channel;
holding means for holding the pipe wall in relative spatial relationship to the slitter assembly; and,
power means for moving the slitter assembly relative to the holding means.

3,921,483

APPARATUS FOR FEEDING AND CUTTING A BAND OF SHEET MATERIAL

Robert J. Chiabrandy, Saugus, Mass., assignor to Kayser-Roth Corporation, New York, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,942
Int. Cl.² B26D 1/10, 5/42
U.S. Cl. 83—277 **16 Claims**



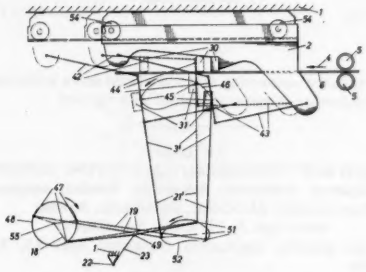
1. In an apparatus for longitudinally feeding an elongated band to a predetermined location and for cutting across the band, elongated guide means situated at the region of said predetermined location for guiding a band longitudinally along a predetermined path to said location, means for selectively, intermittently advancing predetermined lengths of said band along said predetermined path to said predetermined location, cutting means cooperating with said guide means for cutting through said band at a given distance in advance of said predetermined location between selected advances of said band by said advancing means to sever the portion of said band at said predetermined location, and releasable holding means cooperating with said guide means for releasably holding said band stationary at a part of the band situated along said path in advance of said cutting means in at least a portion of the period during and after cutting by said cutting means, said holding means releasing said band before the next advance thereof by said advancing means, so that when the band is releasably held by said releasable holding means the part of the band extending from said cutting means in a direction away from said predetermined location is held in place, wherein said guide means includes an upwardly directed guide surface on which the band rests during movement along said path, a pair of side portions extending upwardly from said guide surface in a direction of said path and defining between themselves a space which the band is located while resting on said upwardly directed guide surface, and a cover situated over said upwardly directed guide surface and said side portions and being fixed to at least one of said side portions, said releasable holding means including an elongated holding pin supported by said guide means for movement from a lower retracted position where said pin has a top end located no higher than said upwardly directed guide surface to an upper

holding position where said pin projects upwardly beyond said upwardly directed guide surface and presses a band against a downwardly directed surface of said cover.

3,921,484
FLYING SHEAR FOR DIVIDING MOVING SHEET-METAL STRIP

Otto Rasenberger, Goeppingen, Germany, assignor to L. Schuler GmbH, Goeppingen, Germany

Filed Jan. 20, 1975, Ser. No. 542,302
Claims priority, application Germany, Jan. 19, 1974, 2402571
Int. Cl.² B23D *25/04*
U.S. Cl. 83—320 **7 Claims**



1. Flying shear apparatus for cross-cutting moving sheet material comprising:

a first cutting bar,

a second cutting bar,

first reciprocating means for reciprocating both of said bars in the travel direction of the sheet material, said first reciprocating means including a movable driving member attached to only one of said cutting bars and guide means interconnecting said cutting bars with one another for movement together in the travel direction,

and second reciprocating means for reciprocating said first bar relative to said second bar in a cutting direction transverse to said travel direction, said first and second cutting bars being positioned in opposing relationship to one another such that said cutting bars cooperate to cut said sheet material upon a predetermined relative movement of said cutting bars in the cutting direction, said second reciprocating means including a rotatable drive shaft and drive train means drivingly connecting said drive shaft to said first bar, said drive train means including a coupling member and a swivel arm, one end of said coupling member being connected to a crank member rotatable with said drive shaft and the other end of said coupling member being pivotally connected with one end of said swivel arm, wherein the other end of said swivel arm is non-pivotally connected with said first bar for movement with said first bar.

3,921,485
ROTARY BLADE ASSEMBLY

Hubert E. Tobey, Milltown; John W. Hood, East Brunswick, and Dee L. Irvin, Moonachie, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

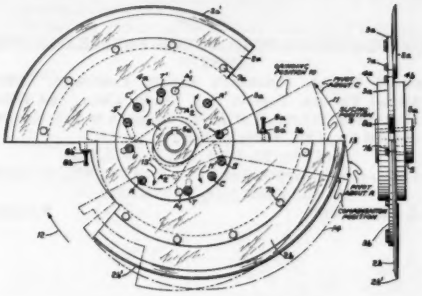
Filed June 25, 1974, Ser. No. 482,924
Int. Cl.² B23D *25/04*; B26D *1/56*
U.S. Cl. 83—342 **18 Claims**

1. Apparatus for slicing, comprising:

a slicing blade rotatably mounted in a cutting plane;

a mounting plate for adjustably mounting said blade to enable the blade cutting edge in one position to move in a helical path;

means for mounting and retaining said plates in said one position; and

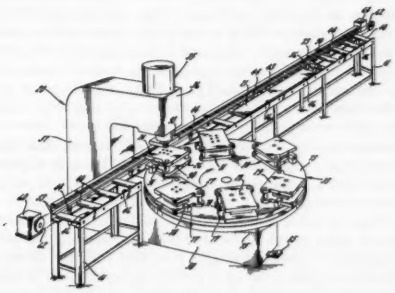


means for adjusting and retaining said blade in a second position in which the blade edge traverses a circular path.

3,921,486
MACHINE TOOL FOR WORKPIECES OF EXTENDED DIMENSION

Raymond L. Valente, Kankakee, Ill., assignor to Manco Mfg. Co., Bradley, Ill.

Filed July 9, 1973, Ser. No. 377,559
Int. Cl.² B26F *1/04*
U.S. Cl. 83—420 **8 Claims**



1. A machine tool for punching a workpiece of extended dimension, comprising means for supporting the workpiece and locating the workpiece at a pre-determined position relative to a work station, a plurality of self-contained punch die sets, each die set including a plurality of punches on an upper member and a corresponding plurality of pre-mated dies on a lower member, a unitary flat-faced movable carrier member removably clamping the self-contained punch die sets thereon in fixed interrelationship, carrier drive means for moving the carrier member to any one of a number of pre-selected positions to locate a selected punch die set at the work station, carrier locking means or locking the carrier precisely in any one of said pre-selected positions, power punch means normally separated from the die sets for first engaging the upper die set member and then compressing the punch die set located at the work station to punch one or more holes in the workpiece, the means for supporting the workpiece including a plurality of fixed, nonadjustable, transverse datum plane-defining means mounted thereon past which the workpiece can be moved, and means on the support means for urging one edge of the workpiece of extended dimension on the support structure abuttively into a pre-determined position against more than one of the fixed, nonadjustable transverse datum plane-defining means, the workpiece support structure further

including means for orienting the workpiece of extended dimension at the work station along a longitudinal plane.

3,921,487

PERFORATOR FOR PERFORATING A STACK OF PAPER SHEETS

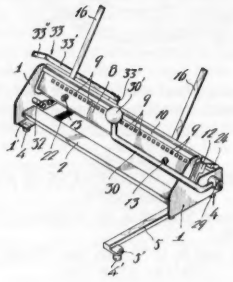
Katsumi Otsuka, Funabashi; Kosaku Yoshizawa, Chiba; Miyagi Tamura, Togane; Koji Kondo, Chiba, and Hideo Tsukamoto, Tokyo, all of Japan, assignors to New Kon Industrial Co., Ltd., Tokyo, Japan

Filed May 31, 1974, Ser. No. 475,332

Claims priority, application Japan, June 27, 1973, 48-76365

Int. Cl.² B26D *5/14*, *7/16*; B26F *1/14*

U.S. Cl. 83—467 **9 Claims**



1. A perforator for perforating a stack of paper sheets which comprises an inclined perforated plate having a plurality of spaced holes therein and a recess in the inner surface extending down from an upper edge and terminating short of a lower edge of the plate to provide a stop for the stack of paper sheets to be perforated, an inclined perforated punching rod guide member positioned opposite to and parallel said inner surface of the perforated plate to define an inclined paper sheet stack receiving opening in cooperation with said recess, said punching rod guide member having a plurality of holes in alignment with the holes in the perforated plate, a plurality of reciprocally movable punching rods disposed in said holes in the punching rod guide member for advancing into and retracting from the holes in the perforated plate, a punching rod actuation member connected to said punching rods for advancing and retracting the rods, an interlocking mechanism, a handle operatively connected to said punching rod actuation member through said interlocking mechanism for actuating the rod actuation member, and a frontal support means which comprises a pair of parallel and spaced upright side plates and a horizontal pivotal support bar positioned adjacent to one of said side plates for pivotal movement between an operating position in which the support bar extends out of the region defined by the side plates and a stowed position in which the support bar is within said region.

3,921,488

COMPACT SLITTING MECHANISM

Elvin A. Mastriani, Roseland, and Robert E. Mastriani, Long Valley, both of N.J., assignors to Arrow Converting Equipment, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 258,871, June 11, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,433

Int. Cl.² B26D *1/02*, *1/22*

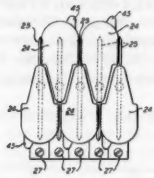
U.S. Cl. 83—505 **21 Claims**

1. A score knife mechanism for connection with a pressure source, comprising:

a. a pressure chamber of generally tear-shape cross-sectional form;

b. a piston in said chamber and a rod connected to said piston and extending from said chamber for movement responsive to pressure admitted into said chamber from the pressure source;

c. a score knife holding member and means to secure a knife for scoring purposes to said holder member; and



d. means for connecting said rod to said score knife holder member for movement thereof with the rod.

3,921,489

GANG SAW WITH IMPROVED CUTTING ACTION

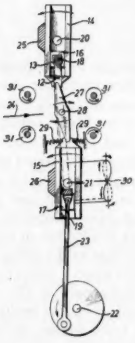
Tage Hjalmar Johansson, Sollentuna, Sweden, assignor to Kockum Industri Aktiebolag, Soderhamn, Sweden

Filed Apr. 5, 1974, Ser. No. 458,443

Claims priority, application Germany, Apr. 13, 1973, 2318819

Int. Cl.² B27B *3/10*

U.S. Cl. 83—779 **8 Claims**



1. A gang saw operating system comprising:

a. a frame,

b. feed means for feeding logs in a specific direction,

c. a sash having saw blades mounted in vertical planes parallel to said log feed direction,

d. drive means for reciprocating said sash up and down in said frame, said drive means including a crankshaft rotatable about an axis and a connecting rod interconnecting said crankshaft and said sash,

e. guide means on said frame guiding said sash for up and down reciprocation in said frame, said guide means including

i. relatively movable upper and lower guide devices guiding respectively upper and lower portions of said sash, and

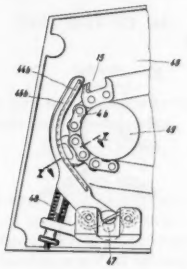
ii. means mounting at least one of said upper and lower guide devices for oscillation relative to said frame independently of said crankshaft in a plane parallel to the planes of said saw blades so that the horizontal oscillation of the sash is not positively guided and so that both guide devices are independent of said crankshaft, and

f. means for moving each point of at least the sash portion guided by said one guide device along an 8-shaped path in a plane parallel to the planes of said saw blades, whereby favorable cutting conditions are ensured, said means including means pivotally connecting said connecting rod with said sash portion.

3,921,490
SAW CHAIN FOR MOTOR CHAIN SAWS

Hans Dolata, Neustadt, and Rolf Sauermilch, Waiblingen, both of Germany, assignors to Andreas Stihl Maschinenfabrik, Neustadt, Germany

Filed Jan. 30, 1973, Ser. No. 328,125
Int. Cl.² B27B *33/14*
U.S. Cl. 83—833 **12 Claims**



1. A saw chain for motor chain saws having lateral links and intermediate links pivotally interconnected, some of said lateral links being designed as cutting tooth links, each said cutting tooth link comprising in combination a part upstanding therefrom generally parallel to the central plane of the chain and twisted about an axis transverse to the cutting direction and substantially parallel to the plane of the respective link, said upstanding part being inclined forwardly in the cutting direction, said upstanding part having an outer edge remote from the chain and a lateral edge which protrudes outwardly from the chain on the respective side of the chain and is disposed at an angle to said outer edge, said outer and lateral edges being joined by a curved transition region, said part rearwardly of said outer and lateral edges and said transition region being relieved to form sharp cutting edges on the leading side of said part, said lateral edge extending laterally of the saw chain to the respective side of the cut taken by said saw chain, and said outer edge being inclined from said transition region inwardly toward said central plane, said cutting edges permitting post-sharpening thereof automatically during rotation of chain saw operation.

3,921,491
BASS SYSTEM FOR AUTOMATIC ROOT FIFTH AND PEDAL SUSTAIN

Alfred B. Freeman, 20418 Seaboard Road, Malibu, Calif. 90265

Filed Apr. 25, 1973, Ser. No. 354,211
Int. Cl.² G10H *1/00, 5/02*
U.S. Cl. 84—1.01 **15 Claims**

1. In an electronic musical instrument having a set of pedals for the notes of a musical scale, a set of tone generators, and an output system including a sound transducer, the combination of:

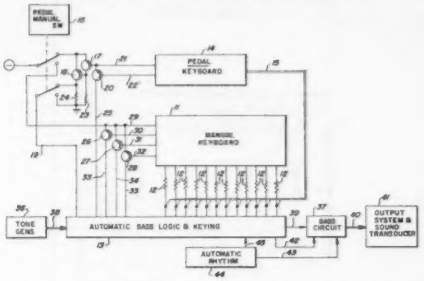
a. a set of latch circuits for the notes of a musical scale, each of said latch circuits having a set and a reset condition;

b. first means responsive to actuation of each of said pedals for setting the one of said latch circuits for the same note;

c. a frequency divider having its output coupled to said output system;

d. means responsive to each of said latch circuits in the set condition for applying an output from one of said tone generators to said frequency divider;

e. means for producing a drive to reset all of said latch circuits while any of said pedals is actuated; and

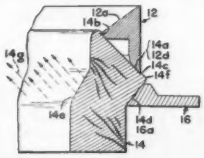


f. means responsive to actuation of each of said pedals for inhibiting the resetting of said latch circuit for the same note.

3,921,492
BANJO BODY ASSEMBLY

Geoffrey H. Stelling, 9142 Shirley Drive, La Mesa, Calif. 92041

Filed Nov. 18, 1974, Ser. No. 524,735
Int. Cl.² G10D *1/10*
U.S. Cl. 84—269 **7 Claims**



1. A banjo body assembly comprising a cylindrical body shell having upper, mid- and lower wall portions, said shell having a downwardly sloping outer surface on the upper portion of said shell, a tone ring having at least one lower internal surface beveled to wedgingly mate with said outwardly sloping surface when said ring is placed on said shell, and a ring-shaped shell flange having an inner surface at least a portion of which wedgingly mates with a sloping outer surface of the mid-portion of said shell.

3,921,493
KEYBOARD CHORD AND RHYTHM COORDINATOR

Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93705

Filed Jan. 29, 1975, Ser. No. 545,208
Int. Cl.² G09B *15/02*
U.S. Cl. 84—474 **7 Claims**

1. An aid for teaching rhythm coordination comprising:

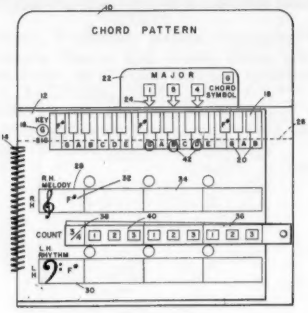
a. a planar base member;

b. a plurality of selectively exposeable panels secured to a lower portion of the forward face of said base member and having coincident straight upper edges;

c. each of said panels having indicia naming a particular key signature, a display of at least a portion of a piano keyboard bordering the upper edge thereof, the keys of said keyboard belonging in said particular key signature being identified by their letter names;

d. means of selecting individual keys of said keyboard representing the scale tones of a particular tone sequence;

e. said panels each being provided with a circumscribed writing area beneath the keyboard display thereon, whereby a student can select a key signature by exposing an appropriate one of said panels, select a tone sequence

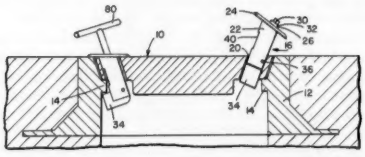


within the selected key signature with said selecting means, and inscribe the scale tone names indicated on the respective keyboard display by said insert on said writing space.

3,921,494
MANHOLE COVER LOCK

Donald K. Coe, Albuquerque, N. Mex., assignor to Loc-Coe, Albuquerque, N. Mex.

Filed Aug. 19, 1974, Ser. No. 498,334
Int. Cl.² F16B *21/00, 23/00*
U.S. Cl. 85—3 R **6 Claims**



1. A manhole cover lock comprising:

a cylindrical housing having an angled upper face at one end with a co-planar flange extending therefrom, and a yoke at the other end;

a first axially displaced longitudinal bore extending through said housing;

a second threaded longitudinal bore adjacent and parallel said first bore;

a control rod slidably housed in said first bore;

a locking plate having a first end shaped for engagement of said control rod, pivotally mounted in said yoke, and having a longitudinal portion, extending substantially laterally of said housing in the direction of the upper end of said angled face, when said control rod is engaged therewith; the length of said control rod being at least as great as the distance from the upper end of said first bore to said first end of the locking plate when said longitudinal portion of the locking plate is in the laterally extended position;

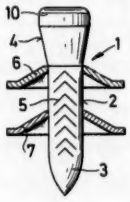
threaded locking means threaded in said second bore having a keyed head member extending over said first bore for causing said control rod to be axially disposed to engage and position said locking plate laterally from said housing in a locked condition and to prevent axial movement of said control rod when said manhole lock is in the locked position, key means requiring a special tool on the head of the threaded locking means defining the sole means for the rotation thereof; and

a recess in said upper face sized to allow said head member to be disposed substantially, below said upper face so that said threaded locking means is contained within said housing when said manhole cover is in the locked condition.

3,921,495
FASTENING MEMBER FOR AN EXPLOSIVE POWDER CHARGE OPERATED SETTING TOOL

Josef Braun, Vaduz; Manfred Hartmann, Frastanz, and Helmut Oesterle, Feldkirch, all of Austria, assignors to Hilti Aktiengesellschaft, Liechtenstein

Filed July 23, 1973, Ser. No. 381,424
Claims priority, application Germany, July 31, 1972, 2237528
Int. Cl.² F16B *15/00*
U.S. Cl. 85—10 E **9 Claims**



1. A fastening member for use in a setting tool operated by an explosive powder charge comprising a nail having an axially extending shank, a nail tip at the forward end of the shank, and two washers positioned on said shank and spaced apart in the axial direction thereof, wherein the improvement comprises that said shank is cylindrically shaped rearwardly from said nail tip, at least one of said washers is dish-shaped with its hollow surface facing in the direction of said nail tip, each of said washers is located on the cylindrically-shaped shank and each said washer has approximately the same outside diameter so that the outer circumferential peripheries of said washers are in alignment, the at least one said dish-shaped washer is located closer to the rearward end of said shank than the other said washer, said nail having a frusto-conical portion extending axially from the rearward end of said shank and widening in the rearward direction from the circumferential periphery of said cylindrically shaped shank, said frusto-conical portion having a cone angle in the range of 15° to 25°, and said nail having a cylindricallyshaped portion extending axially from the rearward end of said frusto-conically shaped portion.

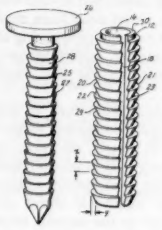
3,921,496
FASTENER ASSEMBLY

J. Frank Helderman, 414 S. Maple St., Graham, N.C. 27253

Filed Nov. 4, 1974, Ser. No. 520,448
Int. Cl.² F16B *13/06*
U.S. Cl. 85—83 **12 Claims**

1. A fastener assembly for use in securing wall panels and the like in place, said fastener assembly including a sheath member formed of resilient material and having an interior opening extending longitudinally therethrough with a relatively smooth and unthreaded interior surface and having projecting thread portions formed along the exterior surface thereof defined by crests and grooves, and a pin member having projecting thread portions formed along the exterior surface thereof defined by crests and grooves, said pin member being positioned in said opening of said sheath member with the crests of the thread portions of said sheath member being located in general alignment with the grooves of the thread portions of the pin member and with a spacing between

the interior surface of said sheath member and the grooves of the pin member whereby the thread portions of said sheath



member will flow into said spacing when said fastener assembly is inserted in an undersized opening.

3,921,497

METHOD OF FILLING AQUIFEROUS BOREHOLES WITH EXPLOSIVES

Wolfgang Christmann, Bergisch-Gladbach-Paffrath; Maximilian Klunsch, Opladen, and Paul Lingens, Leverkusen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Aug. 27, 1973, Ser. No. 391,722

Claims priority, application Germany, Sept. 1, 1972, 2243192

Int. Cl.² F42B *3/00*

U.S. Cl. 86—20 C **12 Claims**

1. In a method filling an aquiferous borehole with a powdered and uncartridged explosive containing swelling agents and water-repellants employing a gaseous propellant issuing from an orifice positioned at the terminal end of a conduit, the improvement which comprises positioning said conduit toward the bottom of said borehole and, during the filling of said borehole with such gaseous repellant and explosives, stepwisely withdrawing said orifice from said borehole while displacing water upwardly in said borehole by said gaseous propellant and maintaining a clearance between said orifice and any powdered and uncartridged explosive deposited in said borehole, the withdrawal of said borehole being such that the orifice is located no more than 50 cm above the surface of any delivered explosive and below the surface of the water in the borehole.

3,921,498

FIN CLIP AND CONNECTOR MOUNT

Sverre Kongelbeck, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1974, Ser. No. 473,104

Int. Cl.² F42B *13/32*

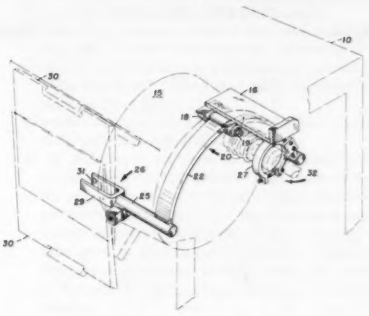
U.S. Cl. 89—1.8 **5 Claims**

1. In combination with a missile launcher and a missile positioned in the launcher for launching therefrom, said missile having fins folded from the normal in-flight position,

a mounting apparatus for retaining the fins in the folded, pre-flight position, said apparatus including bracket means secured to the launcher,

a generally semi-circular yoke member pivotally secured at its mid-point in the bracket means, the member having curving arms extending from the point of attachment of said member with the bracket means and being spaced from the missile, and

fin clips mounted on the ends of the arms of said yoke member, the fin clips extending toward the missile to



engage the folded fins, thereby to maintain the fins in a folded position.

3,921,499

AMMUNITION COOK-OFF SENSING AND PREVENTION SYSTEM

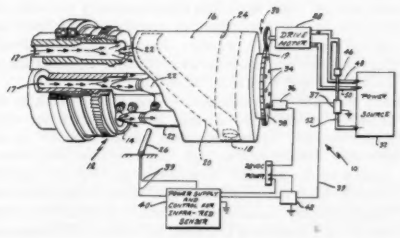
Willard R. Ginsky, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 4, 1974, Ser. No. 439,669

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F41D *11/20*

U.S. Cl. 89—12 **6 Claims**



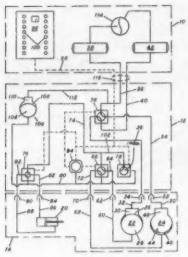
1. An ammunition cook-off sensing and prevention system adapted for use with an automatic weapon having a plurality of barrels circumferentially arranged about a common axis, a rotor assembly supporting said barrels and a housing circumferentially spaced about and rotatably supporting said rotor assembly, said system comprising drive means for rotating said rotor assembly, means for supplying power to said drive means operably connected thereto, means mounted in a predetermined position adjacent said rotor assembly for sensing the heat emanating from an ammunition round carried by said rotor assembly, said sensing means being operably connected to said power supplying means and regulating means operably connected between said sensing means and said power supplying means for controlling the amount of power supplied to said drive means whereby said rotor assembly is rotated by said drive means when the heat emanating from an ammunition round is deemed to be above a predetermined temperature by said sensing means.

3,921,500

SYSTEM FOR OPERATING HYDRAULIC APPARATUS

William H. Silcox, Newport Beach, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 10, 1974, Ser. No. 478,185
Int. Cl.[2] F15B 1/02, 21/04
U.S. Cl. 91—4 15 Claims



1. Means for operating an assembly of apparatus containing hydraulically actuated devices comprising:

a first chamber and a second chamber in said apparatus;

a hydraulic fluid in said chambers;

means for selectively increasing and reducing pressure in said chambers individually;

a hydraulic fluid actuated device in said apparatus;

a first conduit means communicating with said device for conducting a pressurized hydraulic fluid thereto for the actuation of said device;

a second conduit means communicating with said device for conducting discharged hydraulic fluid therefrom;

means for selectively increasing the pressure in the first said chamber to an amount greater than the pressure in the second said chamber to condition said first chamber as a pressure chamber for said hydraulic fluid and to condition said second chamber as a receiving chamber for the discharged said hydraulic fluid;

means operable subsequently for increasing the pressure in said second chamber while simultaneously reducing the pressure in said first chamber thereby to condition said second chamber as a pressure chamber for said hydraulic fluid and said first chamber as a receiving chamber for the discharged said hydraulic fluid; and

means for selectively connecting said first conduit to the chamber conditioned as said pressure chamber while simultaneously connecting said second conduit to the chamber conditioned as said receiving chamber without venting to the ambient atmosphere said means operable for increasing the pressure in said second chamber while simultaneously reducing the pressure in said first chamber as said receiving chamber to enable said hydraulic fluid to flow from said pressure chamber to actuate said device and thence to flow from said device to said receiving chamber;

said chambers and said conduits and said device forming a closed system for retaining all of said hydraulic fluid within said apparatus during the continued operation thereof.

3,921,501

SEQUENTIALLY ACTUATED SERVOMOTOR WITH A PRESSURE DIFFERENTIAL LIMITER

Richard H. Rosback, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Sept. 3, 1974, Ser. No. 502,995
Int. Cl.[2] F15B 9/10
U.S. Cl. 91—32 7 Claims

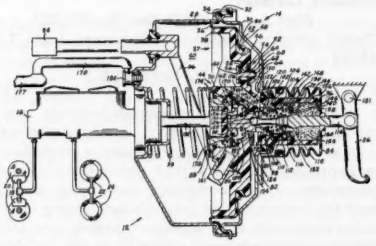
1. In a servomotor having a wall means for separating a front chamber from a rear chamber, control means for sequentially regulating the communication of vacuum, air at atmospheric pressure and air above atmospheric pressure to the rear chamber to develop an operational force from a pressure differential across the wall means to operate a brake actuator in response to an input force, said control means comprising:

first hub means connected to said wall means having a first housing with a first axial bore therein, said first housing having a first passage connecting the first axial bore with the front chamber, said first housing having a second passage connecting the first axial bore with the rear chamber;

second hub means connected to said first hub means for transmitting the operational force to said brake actuator from said wall means, said second hub means having a second housing with a second axial bore coaxial to said first axial bore, said second housing having an entrance port through which air above atmospheric pressure is communicated to the second axial bore, a first annular poppet means having a first end fixed to said first hub means and a second end loosely located in said first axial bore for controlling the communication of vacuum through the first passage in a first mode of operation;

a second annular poppet having a first end fixed to said first hub means and a second end loosely located in the first axial bore for controlling the communication of air at atmospheric pressure through the first axial bore in a second mode of operation;

third valve means located in said second axial bore for controlling the communication of air above atmospheric pressure from the second bore in a third mode of operation;



actuator means located in said first and second axial bores for progressively operating the first, second and third valve means in response to said input force, said first valve means upon movement of the actuator means interrupting communication of vacuum to the second passage to allow air at atmospheric pressure present in the axial bore to flow through the second passage into the rear chamber to develop said pressure differential, said second valve means upon further movement of said actuator means interrupting the flow of air at atmospheric pressure, said third valve means upon still further movement of said actuator means allowing air above atmospheric pressure to enter the second passage to develop said pressure differential;

a first resilient means located between the actuator means and the first annular poppet means, said first resilient means urging the first annular poppet into contact with the actuator means to allow vacuum to evacuate air from the rear chamber in said first mode of operation, said first resilient means urging the first annular poppet into contact with a vacuum seat on the first hub means in said second mode of operation to allow said pressure differential to develop; and

a second resilient means located between said first hub means and said second annular poppet, said second resilient means urging the second annular poppet into contact with a stop on the first hub means during said first and

second modes of operation to allow air at atmospheric pressure to freely be communicated to said first valve means and into contact with the actuator means during said third mode of operation to prevent air above atmospheric pressure from escaping through the axial bore into the atmosphere.

3,921,502
POWER BOOST MECHANISM

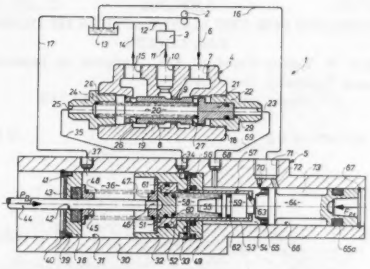
Josef Lauer, Nonnweiler, and Alfred William Thomas, Saarbrucken, both of Germany, assignors to Deutsche Bendix Ausrustungs GmbH, Saarbrucken, Germany

Filed Mar. 27, 1974, Ser. No. 455,106

Claims priority, application Germany, Apr. 12, 1973, 2318447

Int. Cl.² F15B *13/10, 17/02*

U.S. Cl. 91—391 R **8 Claims**



1. A power boost mechanism comprising a housing defining a fluid receiving working chamber and a fluid receiving control chamber therewithin, a piston slidably mounted in said working chamber, an operator-actuated input plunger slidably mounted in said control chamber for controlling the fluid pressure level in said control chamber, valve means responsive to the fluid pressure level in said control chamber to shift from a release position venting said working chamber, said valve means communicating successively higher fluid pressure levels into said working chamber as the valve means is shifted from the rest position, an output plunger operatively connected to said piston and extending into said control chamber, a reservoir defined within said housing, a spring biased pressure differential responsive piston slidable in said reservoir, said spring biased piston having opposed faces on opposite ends thereof, said faces being communicated to the fluid pressure level in the working chamber and in the control chamber respectively, said spring biased piston being responsive to an increase of the fluid pressure level in said control chamber over the pressure level in the working chamber to shift from a rest position to enlarge the effective volume of the control chamber to reduce the fluid pressure level therein, and means carried by the spring biased piston to prevent communication through said reservoir between the working and control chamber regardless of the magnitude of the pressure differential across the spring biased piston.

3,921,503
CONTROL SYSTEM FOR A FLUID SYSTEM

Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich. 48012

Division of Ser. No. 236,736, March 21, 1972, abandoned. This application June 22, 1973, Ser. No. 372,696

Int. Cl.² F01B *3/00*

U.S. Cl. 91—506 **1 Claim**

1. A control system for a variable volume fluid pressure energy translating device of a type having internal fluid displacement means operable upon actuation to vary the volume of fluid displaced by said device, said control system comprising:

a source of high pressure fluid;

a source of low pressure fluid;

said fluid pressure energy translating device comprising:

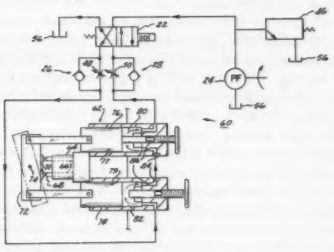
a. a housing having inlet and outlet ports;

b. a cylinder barrel rotatably mounted within said housing, said cylinder barrel having a plurality of arcuately spaced cylinder bores; a plurality of pistons with inner ends disposed for reciprocal stroking movement within said cylinder bores;

c. means successively communicating said cylinder bores with said inlet and outlet ports;

d. an inclined swash plate mounted in said housing in a driving relationship with the outer ends of said pistons for imparting said reciprocal stroking movement to said pistons within said cylinder barrel bores as said cylinder barrel rotates, the amount of fluid flowing from said inlet port to said outlet port being a function of the amount of inclination of said swash plate with respect to the axis of the reciprocal stroking movement of said pistons;

e. fluid displacement means operatively coupled to said swash plate to control the amount of inclination of said swash plate and thus the amount of fluid volume displaced by said device, said swash plate being rotatable about a predetermined axis, said fluid displacement means comprising:



a first piston slidably mounted in a first pressure chamber in said housing and having an extended end with means engaging said swash plate, said first piston being adapted to extend under pressure from said pressure chamber to rotate said swash plate about said predetermined axis in a first direction to increase the volume of fluid displaced by said device;

a second piston slidably mounted in a second pressure chamber in said housing said second piston having an extended end with means engaging said swash plate and adapted to extend under pressure from said second pressure chamber to rotate said swash plate in a second direction to decrease the volume of fluid displaced by said device;

valve means for selectively communicating said source of high pressure fluid to one of said pressure chambers while exhausting the other of said pressure chambers to said low pressure source to thereby control the amount of inclination of said swash plate and thus the amount of fluid displaced by said device; and

restrictive passage means continuously connecting said pressure chambers, said restrictive passage means being so sized as to permit a flow of fluid from said high pressure source to said low pressure source via said pressure chambers when said valve means is operable to connect said high pressure source to said second pressure chamber whereby the temperature of said fluid may be initially elevated without effecting said system said restrictive passage means being so sized as to have no effect on said system when said valve means is operable to connect said

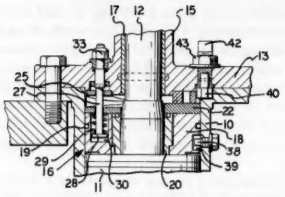
high pressure source to said first chamber.

3,921,504

ADJUSTABLE STROKE INVERT DRIVE MOTOR FOR A GLASS FORMING MACHINE

Eustace H. Mumford, Ottawa Lake, Mich., and Albert W. Rieck, Waterville, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 27, 1973, Ser. No. 401,248
Int. Cl.² F01B *31/14*; F15B *15/22*
U.S. Cl. 92—13.4 **2 Claims**



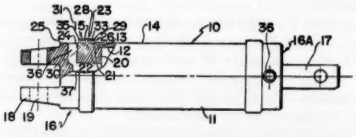
1. An adjustable stroke, reciprocating piston, drive motor comprising a cylinder, piston axially moveable in said cylinder, end closing heads on opposite ends of said cylinder, fluid pressure connections to said heads for moving said piston, a piston rod connected to said piston and extending through an axial opening formed in one of said end closing heads, an axially adjustable, internal, cylinder head positioned between said piston and said one of said end closing heads, a first plate of varying thickness having a planar surface that is fixed to said adjustable head and having an opposed circumferentially tapered cam surface that is in facing relationship to the one of said end closing heads, complementary circumferentially tapered cam means interposed between said one of said end closing heads and said adjustable head, means restraining said adjustable head against rotation, a fixed rod with a flat head extending through said first plate into a recess in said first plate into a recess in said adjustable head, means between said flat head and said first plate for biasing said first plate into contact with the cam, means and means for rotating said cam means relative to said first plate to effect axial displacement of said adjustable head and thereby adjust the stroke of said reciprocating piston.

3,921,505

CYLINDER CONSTRUCTION

Richard Wunsch, Winnipeg, Canada, assignor to Samuel McKee, Winnepeg, Canada

Filed June 10, 1974, Ser. No. 477,925
Int. Cl.² F16J *13/04*, *11/02*
U.S. Cl. 92—169 **1 Claim**



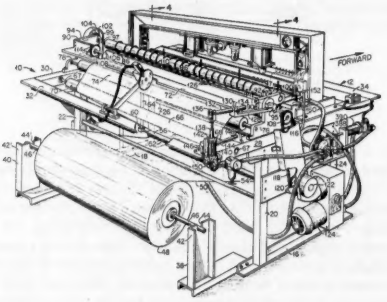
1. A cylinder construction for use with hydraulics and the like which includes at least one fluid port therein; comprising in combination a central hollow cylinder, an end portion for each end of said cylinder, each of said end portions having a shoulder engageable within the ends of said cylinder, sealing means between said shoulders and the inner surface of said ends of said cylinder and means to detachably secure said end portions to said cylinder, said last mentioned means including an annular groove formed around the outer surface of said end portion and an annular groove formed around the outer surface of said cylinder adjacent to but spaced from the end thereof, a split collet assembly engageable with said grooves and spanning the junction between said end portion and the end of said cylinder and means to detachably retain said collets in position, each of said collets including an annular spanning portion and inturned annular flanges one on each side of said spanning portion, one of said flanges engaging within said annular groove in said cylinder, the other of said flanges engaging within said annular groove in said end portion, said means detachably retain said collets in position including a sleeve engaging over said end portion and frictionally engaging the outer surfaces of said collets, said sleeve having an inner end and an outer end, and annular inturned flange on said outer end thereof, engaging with the said other annular flange of said collet to position said sleeve upon said collets.

3,921,506

APPARATUS FOR THE MANUFACTURE OF DUNNAGE BAG LINERS

Clinton R. Hollis, Camden, Ark., assignor to International Paper Company, New York, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,763
Int. Cl.² B31B *1/84*, *23/00*
U.S. Cl. 93—8 VB **9 Claims**



1. In an apparatus for the manufacture of an inflatable liner for a dunnage bag employing a supply of flattened tubular sheet material of indeterminate length that exceeds its transverse dimension the improvement comprising in combination

frame means,

drive roll means adapted to move said sheet material forwardly through said apparatus in a flat condition when in engagement with said sheet material,

means adapted to rotate said drive roll means,

brake means adapted to stop movement of said sheet material through said apparatus when in engagement with said sheet material,

rocker means connecting said drive roll means and said brake means,

means connected to said rocker means and adapted to impart a rotating motion to said rocker means whereby said drive roll means and said brake means are moved alternately into engagement with said sheet material,

monitor means adapted to monitor the forward movement of said sheet material through said apparatus and actuate said means adapted to rotate said rocker means upon the passage of a predetermined length of sheet material past said monitor means to stop said sheet material,

sealing means adapted to contact said sheet material and effect a seal between the two layers of said sheet material and extending fully across the width of said sheet material,

first cutter means disposed at a location rearwardly of and adjacent to said sealing means and adapted

to sever said sheet material in a line across its width when said sheet material is stopped, said line of severance being substantially parallel to said seal, and

second cutter means disposed rearwardly of said first cutter means and adapted to cut an opening in the wall of said sheet material adjacent the unsealed leading end of said sheet material.

3,921,507

AIR DISTRIBUTING OUTLET STRUCTURE IN PARTICULAR FOR AUTOMOBILE VEHICLES

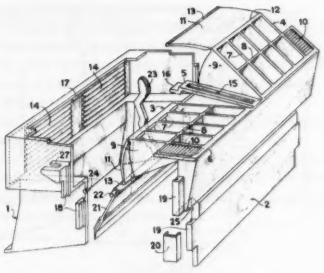
Claude Condet, Rueil-Malmaison, and Francois Verdiere, Suresnes, both of France, assignors to Automobiles Peugeot, Paris, France

Filed Sept. 12, 1974, Ser. No. 505,458

Claims priority, application France, Sept. 19, 1973, 73.33631

Int. Cl.² B60H *1/00*

U.S. Cl. 98—2 5 Claims



1. An air distributing outlet structure, in particular for mounting in the dashboard of an automobile vehicle, comprising fixed duct having side walls, at least one orientable grill composed of plastics material and in one piece with a first of the side walls composed of plastics material of the fixed duct to which first side wall the grill is connected by a thinned-down line constituting a hinge, a tab composed of plastics material in one piece with the grill and connected to the grill by a thinned-down line constituting a hinge, the tab having an end portion, and recesses on an inner surface of a second side wall of the fixed duct opposed to the first side wall, the end portion of the tab being capable of cooperating with the recesses for regulating the orientation of the grill.

3,921,508

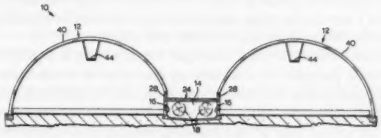
VENTILATED PREFABRICATED METAL STORAGE BUILDING

Karol J. Merson, 1307 Crossfield Bend, Mississauga, Ontario, Canada (L5G 3P5)

Filed Sept. 20, 1974, Ser. No. 507,769

Int. Cl.² F24F *13/00*

U.S. Cl. 98—33 5 Claims



1. A fabricated metal storage building of the type which is ventilated to preserve comestibles comprising

a. at least two elongated fabricated metal building units disposed in an adjacent side-by-side spaced relationship,

b. ventilating plenum means disposed between said building units and extending longitudinally thereof,

c. ventilating passage means opening from said plenum means into each of said building units at longitudinally spaced intervals along the length thereof whereby ventilation of each building unit is provided by way of said ventilating plenum means,

d. means for circulating air through said ventilation plenum and each of said building units,

e. said ventilating plenum means comprising an upper wall member extending transversely between and secured to adjacent side walls of said building units, said upper wall being spaced above the level of the ground between adjacent buildings and co-operating with said side walls to form said ventilating plenum.

3,921,509

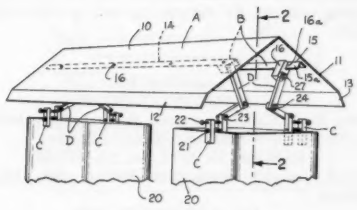
CHIMNEY COVER ASSEMBLY

Jimmy L. Curry, 115 Givens St., Fountain Inn, S.C. 29644, and Curtis E. Moore, Rte. 4, Lynn Drive, Taylors, S.C. 29687

Filed Nov. 16, 1973, Ser. No. 416,463

Int. Cl. E04h *12/28*

U.S. Cl. 98—59 3 Claims



1. A cover assembly for a chimney comprising:

A. a cover portion extending across the chimney in superposed relation thereto;

B. a pair of mounting attachments adjustably carried by the cover portion along a substantial length thereof;

C. clamping means carried by a free upper edge of said chimney;

D. linkage means carried adjacent an upper portion thereof by said mounting attachments and carried adjacent a lower portion thereof by said clamping means;

E. each said mounting attachment includes a clamp and said linkage is pivotally carried thereby adjacent said upper portion thereof and wherein said linkage is pivotally carried adjacent said lower portion thereof by said clamping means, said linkage means including an intermediate pivot between said upper and lower portions; and

F. said mounting attachments include an elongated bar receiving said clamp and extending across a plurality of chimneys,

whereby said cover may be attached in spaced relation above said chimney and permanently clamped thereto.

3,921,510

APPARATUS FOR COMPACTING AND TYING COILS

Jean Emile Glasson, Cormeilles-en-Parisis, France, assignor to Botalam, Paris, France

Filed Jan. 24, 1975, Ser. No. 543,861

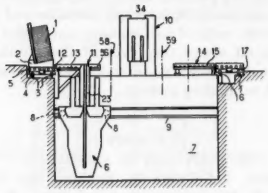
Claims priority, application France, Feb. 6, 1974, 74.04004

Int. Cl.² B65B *13/02*

U.S. Cl. 100—7 5 Claims

1. Apparatus for compacting and tying coils, in which the coils to be tied are supported, with their axes slightly inclined to the vertical, on palettes movable along a guide-way, and comprising a tying unit associated with a cooperating com-

pacting unit, the two units being relatively movable between an aligned position in which the compacting means is operable to compact a coil supported by the tying unit, and a displaced position, at least one reception table positioned such that a palette can be moved off the guide-way onto the reception table, and mounted for pivotal movement about a substantially horizontal axis, means for transferring a palette carrying a coil from the guide-way on to the said table, means for



turning the table about its pivotal axis so as to bring the coil on the palette to a position with its axis substantially vertical, conveyor means for transferring a coil, with its axis vertical, from the palette on the said table to a position within the said tying unit, when the tying unit and compacting unit are relatively displaced, and means for effecting relative movement of the tying unit and the compacting unit to effect alignment thereof.

3,921,511

HORIZONTAL PRESS

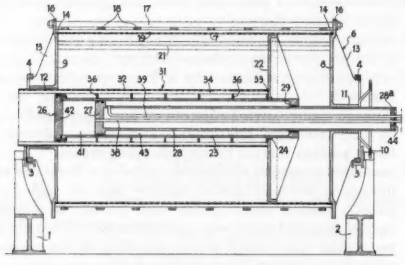
Charles Henri Gall, 72, Avenue du General Leclerc, Cidex 01-03-09, 33220 Ste. Foy-la-Grande, France

Filed Jan. 29, 1974, Ser. No. 437,607

Claims priority, application France, Feb. 15, 1973, 73.05278

Int. Cl.² B30B *9/06*, *9/08*

U.S. Cl. 100—107 **10 Claims**



1. A substantially horizontal press for pressing fruit and in particular grapes, comprising an inner cylindrical cage and an outer cylindrical cage coaxial with the inner cage, the cages having walls pervious to the juice of the fruit to be pressed and defining an annular space and being interconnected to rotate together, a fixed plate adjacent a first end of the outer cage, a second plate movable relative to the first plate axially of the cages between a position adjacent a second end of the outer cage opposed to said first end and a position adjacent said first end of the outer cage, the first plate and second plate axially defining said annular space, the inner cage being connected to move axially with the movable plate and being axially movable through the fixed plate, a fluid cylinder device disposed within the inner cage and comprising a cylinder, a piston axially slidable in the cylinder and a piston rod connected to the piston, means for preventing the piston from moving axially of the fixed plate, means for connecting the cylinder to the movable plate to move axially with the movable plate, a first chamber being defined between the cylinder and the piston on one side of the piston and an annular chamber being defined between the cylinder, piston and piston rod on an opposite side of the piston, and means for supplying actuating fluid selectively to said first chamber and to said annular chamber for respectively moving the movable plate toward the fixed plate for pressing the fruit and moving the movable plate away from the fixed plate and releasing pressure on the fruit, the cylinder defining with the inner cage an annular space for the axial flow of the juice which passes through the inner cage.

3,921,512

APPARATUS FOR TREATING SLURRIES

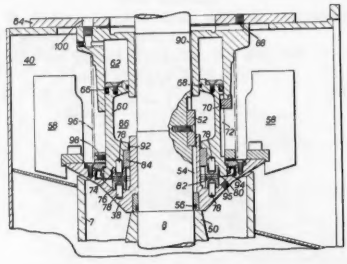
Michael P. H. Burns, Hurley, England, assignor to Watford Engineering Limited, Watford, England

Filed Mar. 21, 1973, Ser. No. 343,236

Claims priority, application United Kingdom, Mar. 29, 1972, 14597/72

Int. Cl.² B30B *9/18*

U.S. Cl. 100—117 **1 Claim**



1. Apparatus for thickening a semi-liquid slurry comprising tubular perforated housing means defining a confined space inclined to both the horizontal and the vertical and having an inlet at its lower end for receiving the slurry,

helical screw means for lifting the slurry within the confined space away from the slurry inlet so as to extract at least some of the liquid from the slurry by the effect of gravitational pressure generated within the confined space on and by the mass of the moving slurry, said helical screw means comprising,

rotatable shaft means mounted within the perforated housing means co-axially therewith, said shaft means having an upper end portion extending beyond the upper end of the perforated housing means, and

a helical thread form fast for rotation with the shaft means, said helical thread form defining with the housing means, a helical passage, the cross-section of said passage progressively reducing towards its upper end,

casing means surrounding the housing means, said casing means having an outlet at its lower end for the extracted liquid,

means separating the inlet from the outlet,

means defining a chamber enclosing the upper end portion of the perforated housing means, the upper end of the perforated housing means communicating with the chamber for discharging thickened slurry into the chamber,

means defining an outlet from said chamber,

means located in said chamber for applying a controllable back pressure to the moving slurry so as to increase the effectiveness of liquid extraction, said means comprising, first piston means mounted on the shaft means adjacent the upper end of the housing means, said piston means having a conical surface co-axial with the shaft means, said surface diverging towards the upper end of the shaft means, said surface facing the upper end of the housing means and defining therewith an annular gap leading from the interior of said housing means into the chamber,

means connecting the piston means to the shaft means to permit axial sliding movement of the piston means relative to the shaft means while rendering the piston means fast for rotation with the shaft means,

second piston means surrounding the shaft means above the first piston means, said second piston means including an annular chamber surrounding the shaft means,

means defining a cylinder surrounding the upper end portion of the shaft means, said cylinder comprising an inner annular wall co-axial with the shaft means, and an outer annular wall surrounding the inner wall and spaced therefrom, the upper end portion of the second piston means being located within the cylinder means between the walls,

means securing the second piston means against rotation with the shaft means while permitting axial movement of the second piston means,

downwardly facing annular bearing means carried by said second piston means co-axially with said shaft means, and upwardly facing annular bearing means carried by said first piston means co-axially with said shaft means, said downwardly facing annular bearing means engaging said upwardly facing bearing means,

means feeding pressurised fluid to said cylinder whereby said fluid applies a downwards force to said second piston means, and said downwards force is transmitted to said first piston means through said bearing means to provide said back pressure,

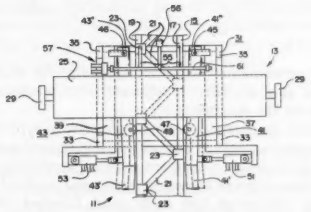
means for adjusting the pressure of fluid fed to said cylinder whereby to control said back pressure, and

means for feeding lubricating fluid into said annular chamber defined by the second piston means, said fluid lubricating the bearing means and acting to damp movement of the second piston means.

3,921,513
DEVICE FOR USE IN THE CONSTRUCTION OF TRUSS MEMBERS

Robert S. Bailey, Memphis, Tenn., assignor to H. W. Jenkins Co., Memphis, Tenn.

Filed July 19, 1974, Ser. No. 489,995
Int. Cl.² B30B *3/04*
U.S. Cl. 100—155 **7 Claims**



1. Device for use with a vertical roller press in the construction of a truss member, said device comprising:

a. press means for selectively applying horizontal compression to the truss member;

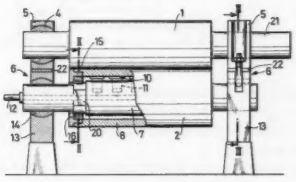
b. activating means for causing said press means to move from a first position out of compressive engagement with the truss member to a second position in compressive engagement with the truss members as the truss member is compressively engaged by the vertical roller press, said press means including a first press member for selectively contacting a first side of the truss member and a second press member for selectively contacting a second side of the truss member, said first and second press members coacting together to apply horizontal compression to the truss member; and

c. frame means with each of said first and second press members including fore and aft ends and said aft end being pivotally mounted to said frame means, said activating means including a first piston member mounted between said frame means and said fore end of said first press member and a second piston member mounted between said frame means and said fore end of said second press member for moving said first and second press members between the first and second positions, each of said first and second press members including a roller member positioned intermediate said fore and aft ends of each press member for applying compressive pressure to the truss member when said first and second press members are in the second position.

3,921,514
ROLLING MILL

Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Switzerland

Filed Jan. 21, 1974, Ser. No. 435,209
Claims priority, application Switzerland, Feb. 8, 1973, 1794/73The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.
Int. Cl.² B30B *3/04*; B21B *31/32*
U.S. Cl. 100—162 B **2 Claims**



1. A rolling mill comprising two rolls, at least one of said rolls including a beam and a cylindrical roll shell rotatably disposed about the beam, means supporting said beam and the other of said rolls in relative positions which are fixed except for flexure and for rotation without translation, two spaced bearing rings for support of said roll shell, two part interengaging means in each of said bearing rings and beam defining a path of limited translational motion for said roll shell as a whole and for said bearing rings substantially parallel to a plane containing the axes of said beam and other roll, and a plurality of pistons supported in cylindrical cavities in said beam and bearing against the inner surface said roll shell.

3,921,515
COMPACTOR

William A. Eckerle, and Albert L. Hardy, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 26, 1974, Ser. No. 464,507
Int. Cl.² B30B *1/18*
U.S. Cl. 100—229 A **7 Claims**

1. A compactor comprising

a frame providing a compacting chamber having an access opening thereinto;

a door mounted for movement between positions opening and closing the access opening;

means for holding an open top container within the chamber;

a pressure plate for movement into and out of the container for compressing refuse therein;

means for vertically reciprocating the plate including

a generally vertical screw and means mounting the plate on the screw; and

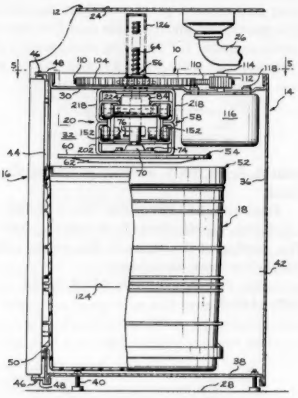
means for driving the screw; and

means bearing between the plate and the frame independently of the screw for maintaining the plate generally

horizontal during downward movement into the container, said plate maintaining means comprising

a first reaction structure rigid with the pressure plate providing a first generally horizontal trackway therealong;

a second reaction structure rigid with the frame providing a second trackway therealong parallel to the first trackway;



a scissors linkage comprising first and second links pivoted together intermediate the ends thereof;

means mounting the upper ends of the links in the second trackway; and

means mounting the lower ends of the links in the first trackway.

3,921,516

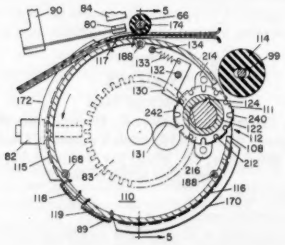
MULTIPLE STATION LABEL PRINTING MACHINE

Roger D. Toft, and Richard M. Froman, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 4, 1974, Ser. No. 457,748

Int. Cl.² B41J *3/46*

U.S. Cl. 101—91 **2 Claims**



1. A printing machine including a supply of record material, means for driving said record material in a path toward a printing station,

printing apparatus comprising a first drum rotatably mounted on an axis along the path of said record material,

said first drum having fixed and removable recording elements on the periphery thereof in spaced relationship, a second drum rotatably mounted on an axis substantially parallel to and spaced from the first mentioned axis, said second drum being substantially enclosed by said first drum and having settable recording elements on the periphery thereof in spaced relationship and including advancement means for advancing said record material to permit printing on different areas thereof aperture means in said first drum adjacent said second drum, a

plurality of print hammer means operable into contact with said record material and against certain of said recording elements,

roller means spaced from said print hammers and movable to a non-operating position during the time of printing by said print hammer means to be selectively engageable with said record material to press said record material against certain other of said recording elements to effect printing on said record material, and means insertable into said second drum and engageable with said settable recording elements for setting thereof and insertable into said aperture means to be engageable with said settable recording elements and with said advancement means for looking thereof.

3,921,517

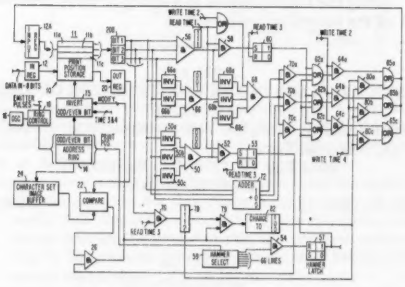
RANDOM FIRING OF MULTIPLE WIDTH PRINT HAMMERS

James G. Barcomb, and Robert K. Conant, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 21, 1974, Ser. No. 481,718

Int. Cl.² B41J *9/14*

U.S. Cl. 101—93.09 **7 Claims**



1. The combination in printer apparatus for printing on a document at a plurality of adjacent print positions along a print line on the document of,

a movable type carrier having a plurality of type characters movable past said print positions and spaced apart at least one print position between adjacent type characters,

a plurality of print hammers positioned at fixed locations along said print line each print hammer being wide enough to span and being capable of printing in two adjacent print positions,

circuit means addressing said print hammers at spaced apart positions along said print line as said type characters move into alignment with said print positions in a plurality of sequential subscan relations and enabling a print hammer to fire when a type character to be printed is at an addressed print position spanned by said print hammer, and

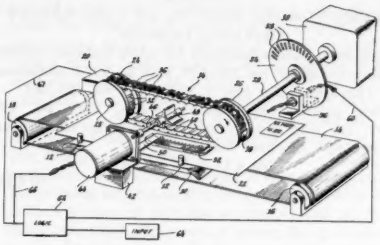
means including counter means connected to said addressing means responsive to firing a print hammer at one of said two adjacent print positions during one of said subscan relations to inhibit firing said print hammer for a predetermined number of subsequent subscan relations after said print hammer is fired to print in one of said adjacent print positions from printing in the other of said two adjacent print positions.

3,921,518

HIGH SPEED PRINTER

W. Robert Carnes, Jr., Darien, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 16, 1974, Ser. No. 433,804
Int. Cl.[2] B41J *1/20*
U.S. Cl. 101—111 4 Claims



1. Apparatus for high speed printing of characters on a surface of a document; comprising:
a flexible belt;
a series of printing elements on one side of the belt;
a plurality of spaced lugs on the opposite side of the belt, said lugs being respectively behind said printing elements;
pulley means supporting said belt for movement of said printing elements in a predetermined direction along a path closely spaced from the surface of said document;
drive means for rotating said pulley means;
an actuating member;
means mounting the actuating member for swinging movement about an axis from a first position on one side of the axis and in the path of travel of the lugs, through an overcenter position, to a position on an opposite side of the axis and out of the path of travel of the lugs;
said actuating member being of a dimension with respect to the location of its axis and the belt to engage and deflect a portion of the belt and a printing element on the belt laterally of the path of travel of the belt to print on the surface of the document during such overcenter movement; and
control means for moving said actuating member to said first position and into the path of travel of a selected lug; said selected lug, with said actuating member in said first position, engaging said actuating member and moving the member through said overcenter position.

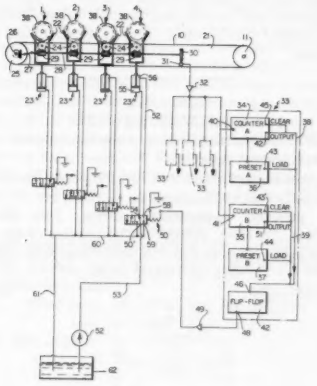
3,921,519

ROTARY PRINTING MACHINE

Peter Zimmer, Untere Sparchen 54, Kufstein, Austria

Continuation-in-part of Ser. No. 304,935, Nov. 9, 1972, abandoned. This application June 11, 1974, Ser. No. 478,388
Claims priority, application Austria, Nov. 15, 1971, 9818/71. The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.
Int. Cl.[2] B41F *5/06*
U.S. Cl. 101—116 8 Claims

1. A rotary cylinder printing machine comprising:
a frame means providing a flat surface for supporting material to be printed;
at least two printing devices supported on said frame means for printing said material, each of said printing devices including a rotary printing cylinder, each of said rotary printing cylinders having a first circumferentially extending printing portion and a second circumferentially extending nonprinting portion;
means for moving said material over said flat surface for sequential contact and printing by the first printing portions of the rotary printing cylinders of each of said printing devices;
driving means, operable by said means for moving, for continuously imparting a constant first rotary movement to the rotary printing cylinders of each of said printing devices and for thus rotating said rotary printing cylinders at a first constant rotary speed equal to the speed of said first rotary movement;
lifting device means connected to each of said printing devices and to the respective adjacent portion of said flat surface for sequentially moving each of said rotary printing cylinders and the respective adjacent portion of said flat surface relative to each other, and for thus sequentially moving each of said rotary printing cylinders out of contact with said material;
means operatively connected to said driving means for indicating the angular positions of rotation of said rotary printing cylinders, with respect to the respective positions of said first printing portions and second non-printing portions thereof;



means positioned to detect the indication of said angular positions and to transmit impulses representative thereof;
a separate digital counting means connected to said means to transmit and to each of said lifting device means for counting the number of said impulses from said means to transmit and for activating said lifting device means upon the counting of a predetermined number of said impulses, thereby moving each of said rotary printing cylinders and said material into and out of contact in a predetermined sequence dependent upon said angular position of respective of said rotary printing cylinders; and
additional rotation means, connected to said driving means, for imparting an additional second constant rotary movement to each of said rotary printing cylinders only when out of contact with said material, and for thus changing the speed of rotation of each of said rotary printing cylinders to a second constant rotary speed, equal to the sum of the speeds of said first and second rotary movements, only when out of contact with said material.

3,921,520

INK APPLICATOR FOR SCREEN PRINTER

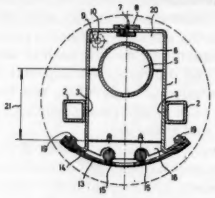
Peter Zimmer, Untere Sparchen 54, A 6330 Kufstein, Austria

Filed May 29, 1973, Ser. No. 364,560
Claims priority, application Austria, May 30, 1972, 4676/72; Feb. 21, 1973, 1509/73
Int. Cl.[2] B41F *15/44*; B05C *1/04*
U.S. Cl. 101—120 9 Claims

1. In a printing machine, in combination:
a receptacle for printing liquid provided with a cylindrically curved, downwardly convex bottom member of elastic

material forming a discharge slot for said liquid parallel to the cylinder axis;

an apertured masking screen underneath said receptacle substantially concentric with and closely spaced from the underside of said bottom member; and



substantially inextensible reinforcing means secured to said bottom member and spanning said slot for preventing its enlargment, said reinforcing means leaving clearances for the passage of said liquid from said receptacle through said slot.

3,921,521
SQUEEGEE DEVICE

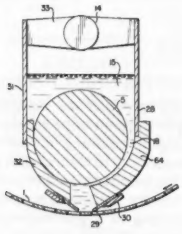
Hans Kudlich, Oberndorf-Ebbs, Austria, assignor to Peter Zimmer, Kufstein, Austria

Continuation-in-part of Ser. No. 164,332, July 20, 1971, Pat. No. 3,807,302. This application Feb. 6, 1974, Ser. No. 439,861

Claims priority, application Austria, July 22, 1970, 6731/70; Dec. 21, 1970, 11462/70. The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.² B41F *15/42*

U.S. Cl. 101—120 **10 Claims**



1. A squeegee device for applying liquid, in particular highly viscous liquid, onto the surface of a material, said device comprising:

a perforated screen mounted for movement in contact at one surface thereof with said material;

a rotatable roller squeegee having an outer extreme surface mounted at a position spaced from said screen;

means for rotating said roller squeegee at a speed greater than the speed of movement of said screen;

a stationary guide wall member having a concave surface, said guide wall member being mounted such that said concave surface is spaced from the cylindrical peripheral surface of said roller squeegee, thereby forming a gap between said roller squeegee and said guide wall member, there being a plane extending through the axis of said roller squeegee and the line formed by the points on said roller squeegee positioned most closely to said screen, said guide wall member being mounted on that side of said plane wherein a point on the periphery of said roller squeegee and said screen approach each other during movement thereof, an edge of said guide wall member being positioned between said roller squeegee and said screen; and

sealing means sealing said guide wall member to said screen; whereby said liquid is conveyed on rotation of said roller squeegee, through said gap and towards the surface of the material and the pressure of said liquid in said gap is increased.

3,921,522
DEVICE FOR THE PRINTING OF LONG REPEAT DISTANCE DESIGNS

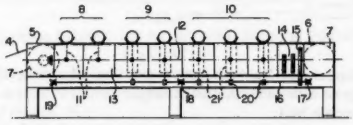
Peter Zimmer, Untere Sparchen 54, 6330 Kufstein, Austria

Continuation of Ser. No. 256,559, May 24, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,201

Claims priority, application Austria, May 24, 1971, 4441/71. The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.

Int. Cl.² B41F *15/10*

U.S. Cl. 101—129 **10 Claims**



2. A process for the continuous printing on a sheet of material of an overall design which is repeated and which has a total repeat length, said overall design including at least two shorter patterns which are repeated within the total repeat length of the overall design, each of said shorter patterns having a short repeat length including a first portion of a first length and a second portion of a second length, said overall design further including a transverse border pattern on the second portion of the last printed of said shorter patterns of said overall design, said process comprising:

A. passing said sheet of material between a printing support surface and a first rotary screen means and printing said first portions only of each of said shorter patterns;

B. subsequently passing said sheet of material to a position adjacent a second rotary screen means which has been maintained out of contact with said sheet of material, lowering said second rotary screen means into contact with said sheet of material to print said second portions only of all but said last printed of said shorter patterns, and thereafter raising said second rotary screen means out of contact with said sheet of material prior to said second portion of said last printed of said shorter patterns being positioned adjacent said second rotary screen means;

C. subsequently passing said sheet of material to a position adjacent a third rotary screen means which has been maintained out of contact with said sheet of material, lowering said third rotary screen means into contact with said sheet of material to print said transverse border pattern only on said second portion of said last printed of said shorter patterns, and thereafter immediately raising said third rotary screen means out of contact with said sheet of material, thereby completing the printing of said overall design; and

D. repeating steps (A) through (C) above while always maintaining said first rotary screen means in contact with said sheet of material.

7. A device for the continuous printing on a sheet of material of an overall design which is repeated and which has a total repeat length, said overall design including at least two shorter patterns which are repeated within the total repeat length of the overall design, each of said shorter patterns having a short repeat length including a first portion of a first length and a second portion of a second length, said overall design further including a transverse border pattern on the second portion of the last printed of said shorter patterns of said overall design, said device comprising:

a printing machine frame having a surface thereon for passage of said sheet of material;

a first rotary screen means having at least one rotary screen for printing said first portion only of each of said shorter patterns, said first rotary screen means being mounted so that said at least one rotary screen thereof is permanently in contact with said sheet of material on said surface;

a second rotary screen means having at least one rotary screen for printing said second portion only of all but said last printed of said shorter patterns, said second rotary screen means being mounted for movement of said at least one rotary screen thereof into and out of contact with said sheet of material on said surface, said second rotary screen means being mounted downstream, in the direction of movement of said sheet of material, of said first rotary screen means;

a third rotary screen means having at least one rotary screen for printing said transverse border pattern only on said second portion of said last printed of said shorter patterns, said third rotary screen means being mounted for movement of said at least one rotary screen thereof into and out of contact with said sheet of material on said surface, said third rotary screen means being mounted downstream, in the direction of movement of said sheet of material, of said first rotary screen means; and

means mounted on said machine frame and operatively connected to said second and third rotary screen means for moving said at least one rotary screen of said second rotary screen means out of contact with said sheet of material when said second portion of said last printed shorter pattern is adjacent said second rotary screen means, for moving into contact with said sheet of material said at least one rotary screen of said second rotary screen means after said second portion of said last printed shorter pattern has passed thereby, for moving said at least one rotary screen of said third rotary screen means into contact with said sheet of material when said second portion of said last printed shorter pattern is adjacent said third rotary screen means, and for moving out of contact with said sheet of material said at least one rotary screen of said third rotary screen means after said second portion of said last printed shorter pattern has passed thereby.

3,921,523
SHEET TAKE OFF DEVICE FOR PRINTING OR DUPLICATING MACHINES

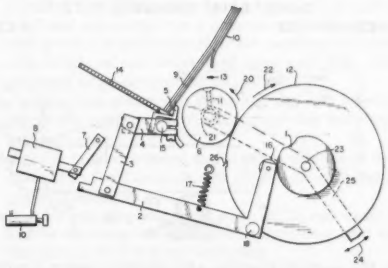
Hans-Joachim Jahme, Hotzstrasse 50, Wiesbaden 6, Germany

Continuation-in-part of Ser. No. 305,551, Nov. 10, 1972, abandoned. This application Sept. 11, 1974, Ser. No. 505,087

Claims priority, application Germany, Sept. 28, 1972, 2248110

Int. Cl.² B65H *3/10*

U.S. Cl. 101—232 **6 Claims**



1. In a printing or duplicating machine of the type including a container means for supporting and storing a stack of sheets prior to their being fed into said machine, said container having an aperture therein, and a rotatably mounted suction operated take-off roller means operable to sequentially grasp and remove the lowermost of said sheets through said aperture in said container and feed them to said machine, the improvement comprising:

a plurality of fingers mounted adjacent said aperture; and

means for moving said fingers back and forth between a first position wherein an end of said lowermost sheet is in the path of the periphery of said roller means and can be grasped and removed by said roller means, and a second position wherein said fingers push said stack of sheets away from said path of the periphery of said roller means and said lowermost sheet cannot be grasped and removed by said roller means; said means for moving comprising a pivot shaft, said fingers being fixedly mounted on said pivot shaft; a rocking lever fixedly connected at a first end thereof to said pivot shaft; a draw rod connected at a first end thereof to a second end of said rocking lever; a pivotally mounted cranked lever connected at a first end thereof to a second end of said draw rod, said cranked lever having at a second end thereof a cam follower; a rotatable cam having a cam surface thereon; and means to urge said cranked lever toward a position with said cam follower in contact with said cam surface; whereby as said rotatable cam is rotated, said crank lever is pivoted as a function of the contour of said cam surface, said pivot shaft is accordingly pivoted by said draw rod and said rocking lever, and said fingers are moved between said first and second positions thereof by said pivot shaft.

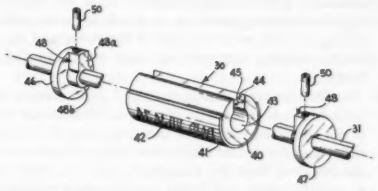
3,921,524
ROTARY PRINTER WITH REMOVABLE PRINTING DIE

Wayne W. Ritchie, Fairfield, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 19, 1974, Ser. No. 507,535

Int. Cl.² B41F *13/20, 5/00*

U.S. Cl. 101—329 **1 Claim**



1. A printing unit: comprising

a frame;

inking means carried by said frame;

a shaft mounted on the said frame;

a printing die mounted on said shaft and adapted to receive ink from said inking means;

said printing die being generally cylindrical in shape and having an aperture formed substantially axially therethrough; said die also being formed with a substantially radially disposed slot which extends through the wall of and throughout the length of said die and communicates with said axially disposed aperture; and

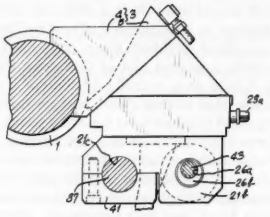
mounting means for mounting said printing die on said shaft including means engageable with said printing die and adapted to secure said die substantially coaxially on and with respect to said shaft; the said slot in said die having an effective width such as to allow said shaft to move radially therethrough whereby said die may be mounted on said shaft without having to remove said shaft from its supported position on said frame; said mounting means including first and second die supporting collars mounted on said shaft, each of said collars having means for securing the collar on said shaft in various selectable axial positions along said shaft; said collars having mutually

facing projections which are shaped so as to be received in nesting and driving relation with respect to the ends of said aperture and slot in said printing die.

3,921,525
ADJUSTABLE AND RETRACTABLE INK SUPPLY MECHANISM FOR PRINTING PRESS

Salvatore F. D'Amato, Floral Park, and Chauncey P. Foote, Jr., Katonah, both of N.Y., assignors to American Bank Note Company, New York, N.Y.

Filed Oct. 30, 1973, Ser. No. 410,987
Int. Cl.² B41F *31/06, 31/30*
U.S. Cl. 101—365 **6 Claims**

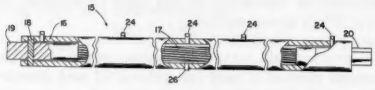


1. Ink supply mechanism for a printing press, comprising:
a. an ink supply roller;
b. ink fountain means including:
   1. a pair of opposed end walls adapted to run in sealing relation with the ends of the roller;
   2. a transverse wall connecting said end walls and spaced from the roller; and
   3. a doctor blade fixed on the transverse wall and projecting therefrom toward the roller, said doctor blade extending the full length of the roller;
c. means for moving the ink fountain means between a retracted position separated from the ink supply roller and an operating position in which the end walls made sliding fit seals with the ends of the roller and the doctor blade yieldably engages the roller along the full length therof;
d. said ink fountain means and said roller cooperating to define an ink receptacle when the ink fountain means is in its operating position, the engagement between the roller and the doctor blade then being effective to control the ink flow from the receptacle onto the roller surface;
e. locking means for fixing the operating position of the ink fountain means and thereby establishing the rate of ink flow from the receptacle onto the roller; and
f. means for adjusting the locking means to vary the operating position of the ink fountain means and thereby to vary the rate of ink flow;
g. said moving means including:
   1. a first shaft on which said ink fountain means is mounted for movement along an arcuate path between its operating and retracted positions;
   2. crank means for moving the ink fountain means along its arcuate path; and
   3. motor means for driving the crank means;
h. said locking means comprising:
   1. a second shaft parallel to the first shaft and supported on the ink fountain means for angular movement about its own axis, said second shaft being movable orbitally about the axis of the first shaft as the ink fountain means moves;
   2. said second shaft having recesses in its ends eccentric with respect to the axis of the second shaft;
   3. support means for said first shaft; and
   4. locking members mounted on said support means and movable endwise of said second shaft between locking positions in which they enter said recesses and retracted positions in which they are removed from said recesses; and
i. said adjusting means comprising means for angularly moving said second shaft.

3,921,526
STRANDED TORSION BAR FOR MAINTAINING A PRINTING PLATE ON A PRINTING CYLINDER

Daryl D. Cerny, Greenville, Ohio, and Phillip R. Rodenberger, Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Feb. 14, 1974, Ser. No. 442,724
Int. Cl.² B41F *27/06*
U.S. Cl. 101—415.1 **4 Claims**

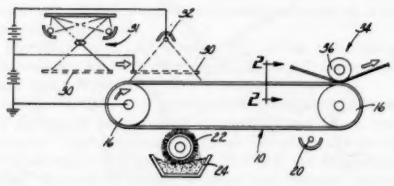


1. A device for mounting a flexible printing plate to a press, comprising:
a curved saddle adapted to be locked to a printing press, said saddle supporting the printing plate about its outer surface and having the general shape of a sector of a hollow cylinder, said saddle having a leading edge and a trailing edge,
a first securing means connected to the leading edge of said saddle to secure one end portion of the printing plate,
a barrel mounted to the trailing edge of said saddle and spaced apart therefrom, said barrel having a second securing means attached thereto for securing the other end portion of the printing plate,
a torsion member comprising a stranded member situated within said barrel along its length, said stranded member being defined by a section of a multiplicity of closely held filaments collectively combined in the form of a wire bundle, one end of the section fixed with respect to said barrel and rotatably mounted with respect to said saddle and its other end being rotatable relative to said barrel end being selectively rotatably connected to the saddle, and a restraining means associated with said barrel for restraining the rotation of said barrel in one direction while said stranded member is being rotated during pretensioning of said torsion member, said barrel being rotatable in the other direction with said torsion member to allow securement of a plate to said barrel.

3,921,527
REUSABLE PRINTING MASTER AND METHOD OF MAKING SAME

Curt R. Raschke, Warrensville Heights, and Ival L. Toepke, Newbury, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Dec. 20, 1974, Ser. No. 534,729
Int. Cl.² B41M *5/00*; G03G *13/22*
U.S. Cl. 101—463 **9 Claims**



1. The method of making a lithographic master, comprising the steps of:
1. providing a flexible carrier support sheet having an oleophobic layer adhered thereto which is highly repellent to oil-based ink, said oleophobic layer having an adhesive

release value, when dry, of less than about 100 grams per square inch and being an electrically insulated material selected from the class of ink release surface materials consisting of a cured elastomeric organopolysiloxane, tetrafluoroethylene, and polyethylene;

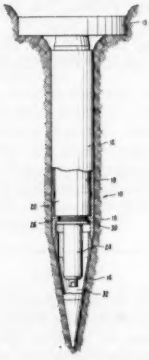
2. creating a blanket electrostatic charge on said carrier support sheet and uniformly toning said sheet with a triboelectric toner;
3. thereafter, subjecting said toned support sheet to a pattern of electrostatic charge to neutralize the electrostatic holding power thus forming loose toner in a pattern formation;
4. providing a transfer surface having a mechanical affiliation for said loose toner in the pattern formation, and placing said transfer surface against said toned support sheet bearing the loose toner pattern to separate the toner into one surface with a negative image and the other with a positive image; and
5. finally, fixing the image to the carrier to produce a lithographic master.

3,921,528

LAND MINE EXPULSION SYSTEM

Albert J. Faulstich, Jr., Silver Spring, and Richard L. Hargett, Frederick, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 15, 1971, Ser. No. 154,239
Int. Cl. F42b *23/00*
U.S. Cl. 102—8 **3 Claims**



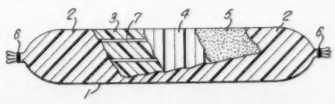
1. An air-delivered, mine expulsion system comprising:
an elongated, cylindrical outer shell having a closed end portion for penetration into the ground;
an elongated inner shell positioned within said outer shell;
a rocket motor integrally fixed to one end of said inner shell and extending into a chamber defined within said end portion of said outer shell for expelling to a predictable height of said inner shell from said outer shell in response to predetermined influences;
gas sealing means between said outer and said inner shells for fluidly sealing said chamber from the remainder of said outer shell;
elongated brake members transversely positioned on the other end of said inner shell to control deceleration upon ground impact; and
means for retaining said inner shell within said outer shell and for releasing said inner shell a short time after actuation of said rocket motor including:
an annular flange formed along the interior of said outer shell approximate said closed end portion;
a threaded portion formed on said inner shell forwardly of said rocket motor which extends through the opening formed by said flange; and
a shearable retaining ring threadedly cooperating with said threaded portion and bearing on the after surface of said flange.

3,921,529

EXPLOSIVE CARTRIDGE

James Glen McKee, Chateauguay, Canada, assignor to Canadian Industries Ltd., Montreal, Canada

Filed Feb. 1, 1974, Ser. No. 438,671
Claims priority, application United Kingdom, Feb. 19, 1973, 7991/73
Int. Cl.² F42B *3/00*
U.S. Cl. 102—24 R **4 Claims**



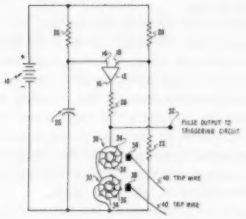
1. A cylindrical explosive cartridge adapted to expand circumferentially upon application of pressure upon an end of the cartridge comprising a substantially rigid thin-wall plastic tube closed at both ends and containing a blasting explosive composition, the said thin-wall tube comprising a laminate of at least two films, the said films being bonded together over substantially all of their areas of contact, the outermost film of the bonded laminate comprising a resilient thin film of thermoplastic material and the contiguous film of the bonded laminate comprising a stiffener film of less resilience than said outer film, the said contiguous stiffener film having longitudinal areas of weakness therein.

3,921,530

ELECTRICAL TRIP WIRE SWITCH

Lawrence E. Burkhardt, Burtonsville, and Basil H. Manns, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 140,392, May 5, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 422,620
Int. Cl. F42c *11/00;* **H03k** *17/60;* **G08b** *13/08*
U.S. Cl. 102—70.2 R **11 Claims**



1. A compact, easily camouflaged, magnetically triggered electrical trip wire switch for use in remote locations for extended periods comprising:
means for producing a fast, high energy, low average power, electrical pulse waveform produced by a voltage sensitive uni-directional conducting device which repetitiously discharges a capacitance upon reaching a predetermined voltage level;
variable induction means comprising a small predetermined number of windings about a miniturized magnetic saturable material for decreasing the magnitude of said electrical pulse waveform below a predetermined output level whenever said magnetic saturable material is saturated;

triggering means for saturating said magnetic saturable material when located proximate thereto; and,

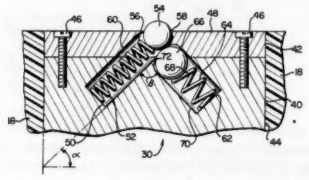
output means for conducting said electrical pulse waveform to indicate said magnitude of said electrical pulse waveform.

3,921,531

DOUBLE ELEMENT SETBACK LOCK

Warren P. Morrow, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 10, 1974, Ser. No. 468,718
Int. Cl.² F42C *15/29*
U.S. Cl. 102—78 **10 Claims**



1. A setback lock apparatus for use with an ordnance missile fuze comprising:

a. a body having:

1. a planar top surface,

2. a first cavity extending in a generally downward direction into said body, said first cavity having an opening at its top defined by the intersection of said first cavity with said planar top surface, and

3. a second cavity contained entirely within said body, said second cavity intersects said first cavity and has an opening at its top defined by the intersection of the top of said second cavity and the side of said first cavity below said planar top surface;

b. a first spring situated within said first cavity;

c. a first mass situated in said first cavity and in contact with said first spring, said first mass being operative in a rest position to protrude through the opening at the top of said first cavity and operative under accelerational forces to move downward into said first cavity and compress said first spring;

d. a second spring situated within said second cavity; and

e. a second mass situated in said second cavity and in contact with said second spring, said second mass being operative in a rest position and under low acceleration forces to protrude through the opening at the top of said second cavity to block the movement of said first mass within said first cavity and being operative under high accelerational forces to move downward into said second cavity, compress said second spring and permit the downward movement of said first mass.

6. A setback lock apparatus for use with an ordnance missile fuze comprising:

a. a body having:

1. a planar top surface,

2. a first cavity extending in a downward direction into said body perpendicular to said planar top surface, said first cavity having an opening at its top defined by the intersection of said first cavity with said planar top surface,

3. a second cavity contained entirely within said body having its major axis perpendicular to said planar top surface, and

4. a third cavity contained entirely within said body located below and havings its major axis parallel to said top planar surface, said third cavity intersecting each of said first and second cavities, and having openings at both ends defined by the intersections of said third cavity with said first and second cavities;

b. a first spring situated within said first cavity;

c. a first mass situated in said first cavity and in contact with said first spring, said first mass being operative in a rest position to protrude through the opening at the top of said first cavity and operative under accelerational forces to move downward into said first cavity and compress said first spring;

d. a second spring situated within said second cavity;

e. a second mass situated in said second cavity and in contact with said second spring, said second mass being operative in a rest position and under low accelerational forces to block the intersection of said second and said third cavities and being operative under high accelerational forces to move downward into said second cavity, compress said second spring and unblocking the intersection of said second and said third cavities;

f. a third spring situated within said third cavity; and

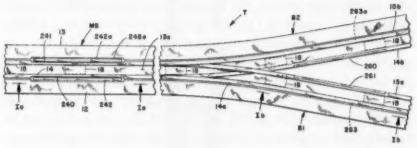
g. a third mass situated in said third cavity and in contact with said third spring, said third mass being operative in a rest position in cooperation with said second mass to protrude through the opening at the intersection of said first and third cavities, and operative under accelerational forces to be released by said second mass and protrude through the opening at the intersection of said second and third cavities.

3,921,532

TRANSPORTATION SYSTEM AND VEHICLE THEREOF

Roy A. Nelson, Grand Prairie, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed May 16, 1974, Ser. No. 470,417
Int. Cl.² E01B *25/06*
U.S. Cl. 104—130 **17 Claims**



1. A transportation system including: a roadway providing a pair of laterally spaced vehicle wheel support surfaces over which support wheels of vehicles are movable and guide means disposed between said vehicle wheel support surfaces providing a pair of horizontal parallel spaced carriage wheel support surfaces spaced inwardly of said vehicle wheel support surfaces and a pair of spaced vertical parallel guide surfaces; and a vehicle movable over said roadway and including a chassis frame having a pair of front and a pair of rear vehicle support wheels turnable about vertical axes and movable over said vehicle support surfaces of said roadway; a drive carriage extending between said vehicle wheels and below said chassis frame and having front and rear end sections and a central section between and movably connected to said end sections, said end sections of said carriage having carriage support wheels rotatable about substantially horizontal axes and turnable about vertical axes for supporting said carriage end sections on said support surfaces of said guide means; individual guide means operatively associated with each of said support wheels of said end sections of said carriage and engageable with said vertical guide surfaces of said roadway guide means for causing said carriage to follow said roadway and for preventing lateral movement of said carriage relative to said roadway; steering mechanisms operatively associated with said pairs of vehicle support wheels and said carriage end sections for causing said pairs of vehicle support wheels to turn in accordance with the turning movement of said carriage end sections; and linkage means connecting said middle car-

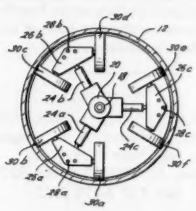
riage section to said chassis frame, for causing said chassis frame to move with said carriage over said roadway, said carriage and said roadway having cooperable means for propelling said carriage over said roadway.

3,921,533

WHEEL ASSEMBLY FOR A VEHICLE MOVING THROUGH A TUBULAR CONDUIT

Freddy R. Szenasi, and Richard M. Baldwin, both of San Antonio, Tex., assignors to Tubexpress Systems, Inc., Houston, Tex.

Filed Sept. 18, 1974, Ser. No. 507,028
Int. Cl.² B65G *51/04*
U.S. Cl. 104—138 R **10 Claims**



1. A wheel assembly for supporting each end of a vehicle moving through a tubular conduit comprising,

an axle connected to each end of the vehicle extending coaxial with the longitudinal axis of the vehicle,

a hub rotatably connected to each axle,

a plurality of struts connected to and radially extending outwardly from each hub,

a wheel supporting bracket pivotally supported intermediate its ends from each strut by a pivot having an axis substantially parallel to said axle, and

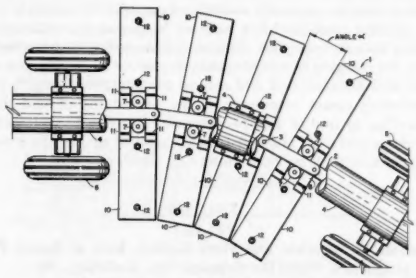
two wheels supported from each bracket, one of said wheels supported on one side of the strut and the other of said wheels supported on the opposite side of said strut whereby each pair of wheels supported from a bracket will be equally loaded.

3,921,534

TURN GUIDE APPARATUS WITH ROLLER MEANS

Ronald W. Umphrey, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 15, 1974, Ser. No. 460,861
Int. Cl.² B61F *9/00*
U.S. Cl. 104—247 **11 Claims**



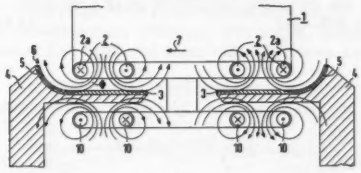
1. A turn guide apparatus for controlling the path of a movable, steerable train of pivotally connected linkage segment means said guide comprising a base means having at least one side roller means adapted to rotatably engage said linkage segment means and apply lateral forces to said linkage segment means, said base means being attached to a support means adapted to removably maintain said base means with said side roller means at a given height above a foundation means to engage said linkage segment means, said turn guide apparatus being hinged to permit disengagement of said turn guide apparatus from said linkage segment means.

3,921,535

ELECTRODYNAMIC SUSPENSION ARRANGEMENT

Alfred Lichtenberg, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 26, 1974, Ser. No. 446,095
Claims priority, application Germany, Feb. 28, 1973, 2310024
Int. Cl.² B61B *13/08*
U.S. Cl. 104—148 SS **1 Claim**



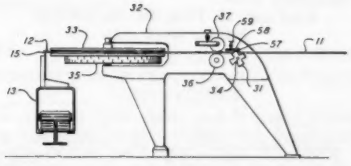
1. In an electrodynamic suspension arrangement comprising at least one current carrying primary conductor loop mounted on a moving body and an electrically conducting plate linearly arranged on a roadbed for generating lifting forces in cooperation with the primary conducting loop, the improvement comprising: (a) the electrically conducting plate on the roadbed having an outer portion curved such that the curve follows the shape of the magnetic lines of force of the primary conductor loop when the moving body is in a laterally symmetrical position relative to the roadbed; and (b) a second current carrying primary conductor loop on the vehicle located on the opposite side of said plate and having a current flowing therethrough in the opposite direction from said one current carrying primary conductor loop.

3,921,536

CABLE GRIP TESTER

Phillip D. Savage, Owls Head, N.Y., assignor to Hall Ski-Lift Company, Inc., Watertown, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,479
Int. Cl.² B61B *7/20*; F16G *11/00*; B61B *12/12*
U.S. Cl. 104—202 **6 Claims**



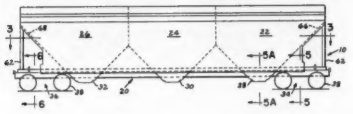
1. A cable grip tester for detecting slippage of grips clamped to a linearly driven cable, comprising: a notched sprocket rotatably supported adjacent the cable, the sprocket notches each being adapted to receive a portion of a grip as it passes for turning the sprocket a fraction of a turn and then releasing the grip, the sprocket having at least one tooth projecting from one side thereof, non-rotating teeth secured adjacent the sprocket and adapted to successively engage the sprocket tooth as the sprocket turns, each tooth having a high point and sloping sides and each non-rotating tooth having a low point

at the end of each sloping side, the non-rotating teeth being spring biased against the sprocket tooth for providing torque resistance to the rotation of the sprocket for each fractional turn thereof, each grip having an elongated and thin track portion extending along the cable, and speed sensing wheel biased against the cable and adapted to pass over the passing grip track portions while torque resistance is applied to the sprocket, the speed sensing wheel being adapted to drive tachometer means for operating a signal when a slowing of the wheel indicates slippage of a grip.

3,921,537
STRUCTURAL HOPPER CAR

James W. Fleshman, Kirkwood; Edgar F. Josephson, and David A. Stoller, both of St. Charles, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 5, 1974, Ser. No. 439,782
Int. Cl.² B61D *7/00, 17/08;* **B61F** *1/00, 1/08*
U.S. Cl. 105—248 **12 Claims**

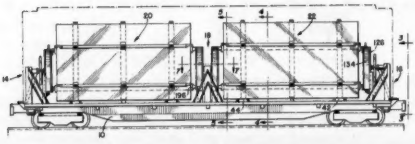


1. A lightweight open top hopper car comprising: opposed, thin, load bearing, curved sides welded to lightweight side sills and top chords; a through center sill passing through a plurality of hoppers in said car; an end sill welded to said center sill at opposite ends of the car, bolster cover plates inwardly from said end sills integrally connecting said center sill to said side sills, said side sills having extensions at opposite ends of the car; said end sills integrally connected to said side sill extensions, reinforcing members extending respectively between said end sills and bolster cover plates, and vertically extending corner posts integrally affixed to said end sills supporting said end hoppers constituting the sole vertical supporting end structure, said center sill, bolster cover plates, side sills, end sills, curved sides and top chords constituting a structural unit, the longitudinal loads being distributed throughout said structural unit, such that a substantial portion of the longitudinal loads will be taken through said center sill and a minor percent will be taken into said side sills and into said load bearing curved sides.

3,921,538
SUPPORT STRUCTURE FOR TRANSPORTING UNCRATED LADING

Albert J. Bundy, Kingsport, Tenn., assignor to ASG Industries, Inc., Kingsport, Tenn.

Filed Aug. 16, 1974, Ser. No. 498,028
Int. Cl.² B61D *3/16*
U.S. Cl. 105—367 **5 Claims**

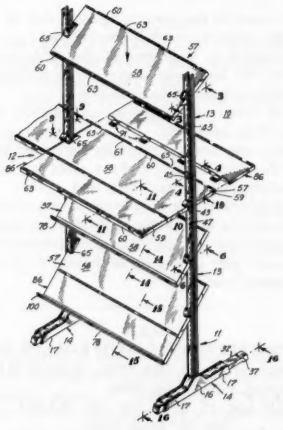


1. In combination with a carrier, an apparatus for substantially immovably supporting lading in uncrated condition for transport by said carrier comprising a frame member adapted to receive and maintain said lading in a generally upright orientation; means cooperable with said frame for preventing movement of said lading in a first direction; means carried by said frame member and said cooperable means for cushioning said lading; restraining means disposed at opposite ends of said frame, each of said restraining means including fulcrum means, a pair of stanchions extending to a height below said fulcrum means, each said pair of stanchions being defined by a first channel member; equalizing means for bearing at spaced locations at opposite ends of said lading to substantially prevent movement of said lading in a second direction; and means movably mounting said equalizing means on said restraining means, each of said frame and restraining means being mounted on said carrier and said mounting means including second channel members, the channel of each of said second members being of a dimension different than that of said first members, said second members being carried by said equalizing means for intercooperation with said first members, and a web member, said web member mounted between said stanchions to provide off-center support of said equalizing means, said support permitting greater freedom of movement of said equalizing means within the limit of movement defined by said channels about said fulcrum.

3,921,539
SHELF SUPPORT STRUCTURE

Barry David Berger, Brooklyn, N.Y., assignor to Thomson-Leeds, Company, Inc., New York, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,653
Int. Cl.³ A47F *5/12*
U.S. Cl. 108—8 **15 Claims**



1. A display device comprising a vertical standard, a coupling member vertically slidably engaging said standard, and a laterally extending shelf member supported by and cooperating with said coupling member, said coupling member limiting the swinging of said shelf member about a laterally extending axis between first and second predetermined angles and including means responsive to the positioning of said shelf member in one of said predetermined angles for releasably locking said shelf member to said standard against the lowering of said shelf member along said standard.

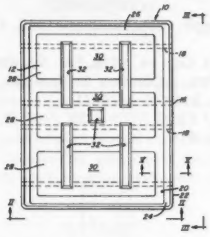
3,921,540
PALLET

Dennis M. Melnick, and Mark Kubick, both of Baden, Pa., assignors to Pallet Development Inc., Ambridge, Pa.

Filed Aug. 14, 1973, Ser. No. 388,253
Int. Cl.² B65D *19/00, 19/44*
U.S. Cl. 108—55 R **4 Claims**

1. A pallet system comprising: a first plurality of material receiving containers each having, a substantially planar lowermost surface; a second plurality of material receiving contain-

ers each having the intermediate portion of the lowermost surface thereof substantially planar and including a peripheral flange portion thereof extending downwardly from said intermediate portion; a pallet adapted to selectively support said first and second plurality of containers formed of resinlike material and having an upper load receiving wall, a lower wall downwardly spaced from said upper wall and adapted to engage the tines of a lifting device and a vertical wall continuously extending between said upper and lower walls adjacent the outer peripheries thereof; said upper wall including a horizontally extending main bearing portion located intermediate the outer periphery thereof and a first retaining flange portion extending along said upper wall adjacent the outer periphery thereof and extending substantially vertically upwardly with respect to said main bearing portion; when said first plurality of containers are supported on said pallet at least



a major portion of the lowermost surfaces thereof are bearing on said main bearing portion and said first retaining flange portion transversely captively retains said first plurality of containers thereon; said upper wall additionally including a second retaining flange portion inwardly spaced from said first flange portion and outwardly spaced from said main bearing portion with the peripheral extent of said second flange portion being generally parallel to the peripheral extent of said first flange portion and with the vertical extent thereof being substantially vertically downwardly with respect to said main bearing portion; and when second plurality of containers are supported on said pallet at least a major portion of said intermediate portion are bearing on said main bearing portion and second retaining flange portion cooperates with said peripheral flange portion to transversely captively retain said second plurality of containers thereon.

3,921,541

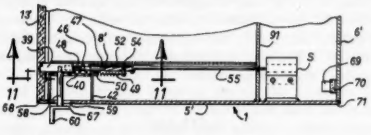
REMOTE CONTROLLED STRONG BOX ASSEMBLY AND LATCH THEREFOR

Guy Chartrand, 110-11th St., Laval, Quebec, and Jacques Des Aulniers, 300-5th Ave., L'Achigan, Quebec, both of Canada

Continuation-in-part of Ser. No. 113,178, Sept. 3, 1971, abandoned. This application July 30, 1973, Ser. No. 384,001

Int. Cl. E01g *1/04*

U.S. Cl. 109—59 **14 Claims**



1. A strong box assembly for the protection of valuables comprising a strong enclosure structure having a door aperture, a door structure mounted on said enclosure structure and arranged to close said door aperture, a latch means mounted onto one of said structure to releasably lock said door structure in closed position, a remote-controlled actuating means positioned inside said enclosure structure, engaging said latch means, and constructed and arranged to be operated from a remote location outside said enclosure structure, a manual actuating means operatively connected to said remote-controlled latch means, projecting exteriorly of said enclosure structure, and constructed and arranged to be manually operated to complete unlatching of said door and wherein the other of said structures has a notch, one of said latch means and notch has a step and actuation of said remote-controlled actuating means causes said latch means to take an intermediate retracted position into which said step is operatively engaged and arranged to retain said door in a partially open position, and said manual actuating means is constructed and arranged to further retract said latch means to clear said notch and release said door structure for complete opening.

3,921,542

OXYGEN SUPPLIED THERMAL LANCE

Ernst Brandenberger, Wetzikon, Switzerland, assignor to Kubatec Kunststoff- und Bautechnik AG, Triesen, Liechtenstein

Filed Jan. 15, 1975, Ser. No. 541,276

Claims priority, application Switzerland, Jan. 23, 1974, 897/74

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—1 R **16 Claims**

1. Thermal, consumable lance comprising

a jacket tube (2) and a plurality of core wires inserted in the jacket tube, the core wires having an overall cross-sectional area which is less than the cross-sectional area within the jacket tube to leave space for passage of oxygen between the core wires and the jacket tube, the lance and core wires being relatively formed to retain the core wires within the jacket tube,

wherein the improvement comprises

the jacket tube has an outer diameter of about 3 to 10 mm; eight to sixteen core wires (3) are located within the jacket tube (2);

the cross-sectional area of the space forming oxygen ducts (5) has a ratio to the total cross-sectional area of jacket tube (2) material and core wire (3) material of between about 1 : 4 to 1 : 10; and the ratio of diameter of core wire (3) to the wall thickness of the jacket tube (2) is between about 1 : 0.7 to 1 : 2.

3,921,543

METHOD OF INCINERATING SALT-CONTAINING LIQUID SLUDGE

Richard Menigat, Dietzenbach, and Wolfgang Fennemann, Karben, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 15, 1974, Ser. No. 488,795

Claims priority, application Germany, July 28, 1973, 2338432

Int. Cl.³ F23G *7/00*

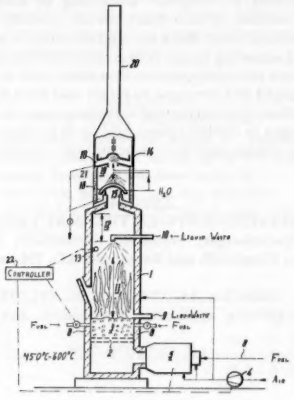
U.S. Cl. 110—7 B **6 Claims**

1. A method of operating a fluidized bed incinerator for burning wastes containing sodium chloride and water, said method comprising the steps of:

a. fluidizing a particulate bed of an inert material in the wastes with an oxygen-containing gas creating a turbulencing gas with a superficial velocity equal to at least 3 meters/second;

b. heating said bed in said incinerator to a temperature above the melting point of said sodium chloride to form an exhaust gas containing a predominant part of said sodium chloride entrained within the exhaust gas;

c. scrubbing the exhaust gas to remove the sodium chloride contained therein;



d. discharging the now sodium chloride-free exhaust gas from the incinerator; and

e. accumulating the remaining sodium chloride in particulate form to then become part of the fluidized bed itself for subsequent waste incineration.

3,921,544

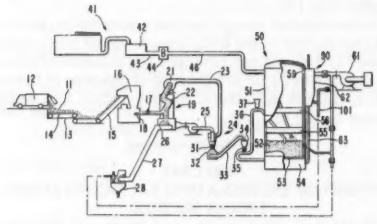
METHOD AND APPARATUS FOR PARTICLE COLLECTION IN THE EXHAUST OF A FLUID BED DISPOSAL APPARATUS

Richard G. Reese, Woodside, Calif., assignor to Combustion Power Company, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 247,829, April 26, 1972, Pat. No. 3,818,846. This application June 24, 1974, Ser. No. 482,618

Int. Cl.² F23G 7/00; B01D 45/12

U.S. Cl. 110—8 F **4 Claims**



1. In a waste disposal apparatus for consuming waste with minimal residue and a substantially pollution-free gaseous output including a combustion housing, a bed of granular material, means for supporting the bed of granular material within the housing, and means for providing combustion air to the bottom of the bed for maintaining the granular material in a fluidized state, the improvement comprising:

means for exhausting from the combustion housing combustion air laden with flyash and a certain amount of the granular material,

first stage inertial separator means connected to said exhausting means for separating the granular material in the exhaust from the remainder of the exhaust gas,

means for returning the granular material separated by said first stage inertial separator to the bed of granular material.

second stage inertial separator means for separating out from said remainder of the exhaust gas from said first stage inertial separator means the remaining particulate material,

housing means surrounding said first and second stage inertial separator means, and

means for conducting the combustion air from the means for providing combustion air through said housing means to the bottom of the bed for heat exchange with said inertial separator means.

3,921,545

CONVEYOR INSTALLATION WITH A SCREW CONVEYOR

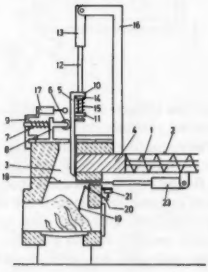
Walter Ruegsegger, Tobelhofstrasse 348, CH-8044 Zurich, Switzerland

Filed Aug. 16, 1974, Ser. No. 498,062

Claims priority, application Switzerland, Aug. 24, 1973, 12165/73; Apr. 2, 1974, 4549/74

Int. Cl.² F23G 7/00; F23K 3/16; B30B 1/32

U.S. Cl. 110—8 R **11 Claims**



1. In combination, a furnace having a furnace chamber and a conveyor installation for supplying a solid combustible material to the furnace chamber, the conveyor installation comprising means for delivering the solid combustible material under pressure, a compression chamber having an inlet and an outlet, the delivering means being in communication with the compression chamber inlet to deliver the solid combustible material under pressure into the compression chamber, a closure member arrranged to close and open the outlet of the compression chamber selectively, the compression chamber outlet being in communication with the furnace chamber, control means operative to maintain the closure member in the closed position until a predetermined force exerted by the compressed material in the compression chamber on the closure member moves the closure member to open the outlet and again moves the closure member to close the outlet after the pressure of the delivering means has ejected compressed material into the furnace chamber through the open outlet, and a control element in the furnace chamber actuated by the level of the material in the furnace chamber for deactivating the material delivering means.

3,921,546

IMPLOSION DOOR OPERATING MECHANISM

John Andrew Makuch, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 30, 1974, Ser. No. 537,816

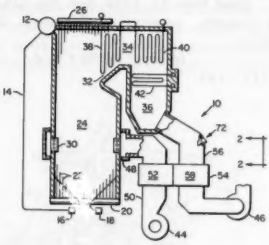
Int. Cl.² F23M 11/00

U.S. Cl. 110—173 B **16 Claims**

1. Mechanism for inducing pivotal movement in a member that is connected to a base by means of a pivot shaft fixedly

attached to said member and bracket means on said base adapted to receive said pivot shaft for pivotal movement therein, said mechanism comprising:

a. a hollow body defining a container fixedly attached to said pivot pin;



b. a pair of compartments formed in said container each being disposed on opposite sides of the axis of said pivot pin;

c. a body of liquid housed in said container; and

d. means for transferring said liquid body between said compartments upon angular movement of said member.

3,921,547

DISPENSING ROD LIKE ARTICLES

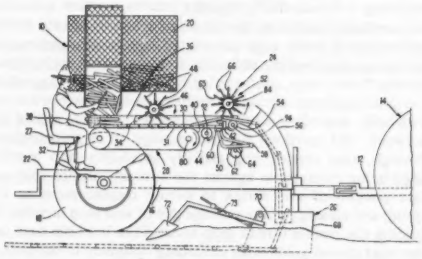
Cecil C. Etwell, Via Mackay, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Dec. 7, 1973, Ser. No. 422,625

Claims priority, application Australia, Dec. 28, 1972, 1744/72; Feb. 1, 1973, 2099/73

Int. Cl.² A01C *11/00;* **B65G** *47/14*

U.S. Cl. 111—1 **7 Claims**



1. A sugar cane planter for planting sugar cane billets including a frame, at least one furrow opening means mounted on the frame, a billet container with a billet outlet for storage of randomly oriented sugar cane billets mounted on the frame; conveyor means for conveying sugar cane billets from the billet container to the furrow opening means including a continuous belt conveyor mounted on the frame with a portion of the belt positioned below the billet outlet from the billet container; alignment means including at least two side walls mounted on the frame directly above the continuous belt conveyor and spaced apart a distance less than the length of the major portion of the sugar cane billets to form a channel with the conveyor belt as the bottom of said channel and the side walls as the sides of said channel, said channel having a long axis that is generally parallel to the long axis of the continuous conveyor to orient the billets so that their long axes are generally parallel to the long axis of the channel; and a metering mechanism mounted on the frame adjacent to the delivery end of the continuous belt conveyor for metering cane billets from the continuous belt conveyor, said metering mechanism including a stop positioned to intercept aligned billets fed toward the stop by the continuous belt conveyor, a movable feed member positioned for engagement with sugar cane billets that are in engagement with the stop and actuating means for operating the feed members to dislodge sugar cane billets from said stop.

3,921,548

PLANTING MACHINE FOR PLANTING POTTED PLANTS, BULBS, TUBERS AND THE LIKE

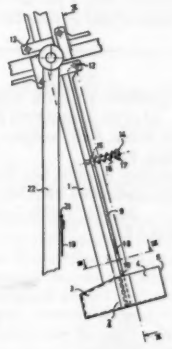
Antonius Johannus Cornelus Alkemade, Herenweg, Noordwijk, Netherlands

Filed May 17, 1974, Ser. No. 470,944

Claims priority, application Netherlands, May 22, 1973, 7307106

Int. Cl.² A01C *11/00*

U.S. Cl. 111—2 **16 Claims**



1. A machine for introducing a plant into the ground including: means for moving the machine along the ground; at least one arm mounted for rotation in a generally vertical plane by means of a shaft running transversely to the direction of movement of the machine and parallel with the ground, said arm at its free end being provided with a digging element for locally digging a furrow in the ground and having substantially the shape of a tray on which the plant which is to be planted can be carried, said tray being open at its back end as viewed in the direction of said rotation; and means carried by said arm and movable above the surface of said tray for pushing the plant out of said tray and into the furrow freshly dug by said tray when said arm is at or near its lowermost position.

3,921,549

MATERIAL HANDLING DEVICE FOR FEEDING LABELS TO A SEWING MACHINE

Sam M. Goodson, 1107 Fleetwood Drive, Lookout Mountain, Tenn. 37350

Filed May 24, 1974, Ser. No. 473,200

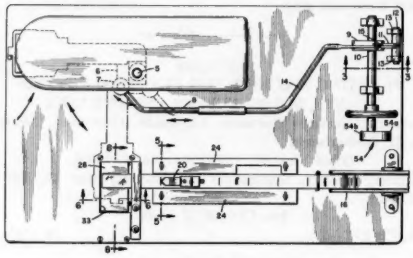
Int. Cl.² D05B *3/12*

U.S. Cl. 112—104 **30 Claims**

1. A material handling device for use with a machine having a pickup head for moving pieces of material cut from a strip from one position to another position, said device comprising: a substantially horizontally extending platform for supporting a portion of material,

means for feeding a portion of a strip of material to said platform in a material-feeding direction,

and a cutter intermediate said feeding means and said platform for cutting a portion of material from a strip of



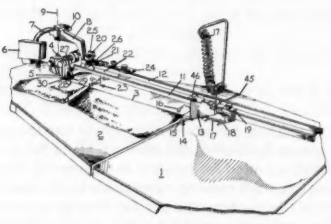
material whereby after a portion of material is cut from a strip of material that portion lies on the platform.

3,921,550

GUIDE AND SEWING DEVICE FOR FABRIC LAYERS ALONG A SHAPED EDGE

Nerino Marforio, Milan, Italy, assignor to Virginio Rimoldi & C. S.p.A., Milan, Italy

Filed May 1, 1974, Ser. No. 465,907
Claims priority, application Italy, May 22, 1973, 24366/73
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.12 **3 Claims**



1. An apparatus for guiding and sewing layers of fabric along an edge of irregular configuration comprising:

a. a working plate;

b. a sewing machine fixed to one end of said working plate;

c. a support arm extending from said working plate having rotatable guide means carried thereby in a plane parallel with and spaced from said working plate;

d. means movable along said rotatable guide means for clamping the fabric and advancing the same toward said sewing machine on said working plate;

e. sensing means carried by said working plate for detecting variations in the edge of the layers of fabric to be sewn; and

f. drive means interconnecting said sensing means with said rotatable guide means which includes;

1. a stepping motor; and

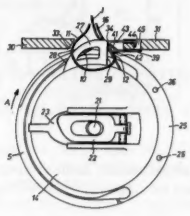
2. means operatively connecting said stepping motor with said rotatable guide means for actuating the latter and orienting the edge of the layers of fabric in the direction of said sewing machine in timed sequence with the operating speed thereof.

3,921,551

LOCK STITCH SEWING MACHINE HAVING A ROTATABLE SHUTTLE

Kurt Gustmann, Kaiserslautern, and Ludwig Sourisseaux, Ramstein-Miesenbach, both of Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

Filed Nov. 18, 1974, Ser. No. 524,863
Claims priority, application Germany, Dec. 11, 1973, 7343899[U]
Int. Cl.² D05B *57/14*
U.S. Cl. 112—181 **4 Claims**



1. A lock stitch sewing machine, comprising a housing having a bed plate with an opening therethrough, a reciprocated sewing needle mounted for reciprocation on said housing on one side of said bed plate opening, a shuttle rotatably mounted for rotation on said housing on the opposite side of said bed plate from said needle in position for cooperation with said needle, said shuttle including a bobbin case, a rotatable shuttle having a thread loop pick-up point, a thread supply in said case, a case carrier having a catch shoulder for engaging the thread and being rotatable relative to said shuttle within predetermined limits, a stop fixture mounted on said bed plate adjacent said shuttle, a spring on said stop fixture including a substantially straight interior portion extending substantially parallel to the plane of rotation of said shuttle and a thread guide edge connected to said straight interior portion and extending obliquely to the pull off path of said needle thread loop, said carrier having a carrier stop which comprises an outer circumferentially sloping edge portion and a radially extending stop member edge portion with a gap between said portions for the passage of a thread therethrough, said carrier stop radially extending stop member edge being engageable against the straight interior stop surface portion of said spring to permit displacement of said spring and clearing of the passage gap of said stop member for guiding the needle thread loop around the bobbbin case carrier, said thread guide edge extending obliquely to the pull-off path of the needle thread loop and diverging from a radially extending stop member edge of said carrier in a direction opposite to the pull-off direction of the needle thread loop.

3,921,552

WORK FEED MECHANISMS FOR SEWING MACHINES

Louis F. Daman, Martinsville, and Stanley J. Ketterer, Jamesburg, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,413
Int. Cl.² D05B *27/02*
U.S. Cl. 112—215 **6 Claims**

1. A work feeding mechanism for a sewing machine having a work supporting surface on the bed of the machine for feeding said work fabric transversely across said work supporting surface, said work feeding mechanism comprising:

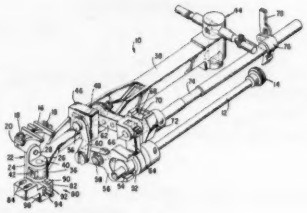
an elongated feed bar arranged in said bed and extending substantially perpendicular to the work feed direction,

a feed dog arranged to engage said work and transport the same on said work supporting surface,

means beneath said work supporting surface pivotally securing said feed dog to one extremity of said feed bar,

gimbal means mounted in said bed and engaging the opposite extremity of said feed bar,

drive means operable in timed relation with said sewing machine for oscillating said feed bar about said gimbal means in mutually perpendicular directions, one direction being transversely of said work supporting surface to provide the work feed and return strokes of said feed dog and the other direction being toward and away from said



work supporting surface to raise said feed dog to a position above said work supporting surface during the work feed stroke and to drop said feed dog below said work supporting surface during the return stroke,

constraining means located below said means pivotally securing said feed dog to said feed bar and affixed to said machine bed for maintaining said feed dog substantially straight with respect to the work supporting surface so the said feed dog remains parallel to the work supporting surface and the work fabric is fed on a substantially straight line.

3,921,553

LOCK STITCH ROTATING SHUTTLE

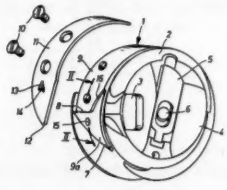
Kurt Gustmann, Kaiserslautern, and Ludwig Sourisseaux, Ramstein, Miesenbach, both of Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

Filed Nov. 18, 1974, Ser. No. 524,864

Claims priority, application Germany, Jan. 25, 1974, 7402540[U]

Int. Cl.² D05B *57/14*

U.S. Cl. 112—228 **2 Claims**



1. A lock stitch rotating thread shuttle, comprising a curved shuttle body having a forward oblique edge terminating in a shuttle tip for the thread, a curved thread guide sheet overlying and secured to said shuttle body, said shuttle body including a forward portion containing said shuttle tip of reduced dimension so that it is spaced from and parallel to an overlying portion of said thread guide sheet, a recess defined in said shuttle body forward portion, said thread guide sheet having a tongue portion projecting into the recess of said shuttle body.

3,921,554

THREAD-TRIMMING DEVICE ON A SEWING MACHINE

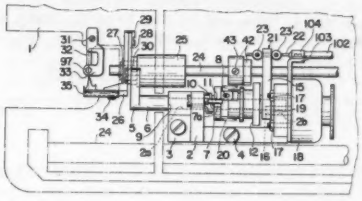
Seizo Uozaki, Toyota, and Hitoshi Sakashita, Aichi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 29, 1974, Ser. No. 474,462

Claims priority, application Japan, May 30, 1973, 48-61376

Int. Cl.² D05B *65/02*

U.S. Cl. 112—252 **4 Claims**



1. A thread-trimming device for an industrial sewing machine, comprising:

a. a first shaft rotatably driven by a main shaft of the machine;

b. first ratchet means disposed upon said first shaft and rotatable therewith;

c. stationary blade means fixedly secured to the framework of said machine;

d. a second shaft disposed parallel to said first shaft;

e. pivotably movable blade means connected to said second shaft;

f. second ratchet means disposed upon said second shaft and being axially movable relative thereto so as to selectively engage said first ratchet means; and

g. electrically operated means for moving said second ratchet means along said second shaft so as to engage said first ratchet means, whereby said second shaft will be rotated so as to move said movable blade means relative to said stationary blade means to perform the thread trimming operation.

3,921,555

METHOD OF CONSTRUCTING A SPHERICAL TANK OR THE LIKE

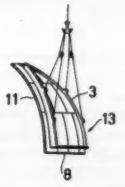
Takao Suzuki, and Naoichi Takenaka, both of Tamono, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,319

Claims Priority, application Japan, Apr. 6, 1973, 48-39207

Int. Cl.² B21D *51/00*

U.S. Cl. 113—116 W **4 Claims**



1. A method of constructing a tank or the like in the form of a sphere having an equatorial line and several longitudinal lines, comprising the steps of prefabricating large-sized blocks of a triangular shape with a surface conforming to a segment of a spherical surface, the outline of each block extending along the equatorial line and plurality of the longitudinal lines of the segmental spherical surface, welding connecting pieces to the segmental spherical surface of said blocks and bolting

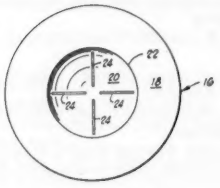
triangular reinforcements to said connecting pieces to thereby temporarily attach the same, and assembling these large-sized blocks by welding along the longitudinal lines and the equatorial line to complete the structure, and, after assembling the blocks, removing the reinforcements.

3,921,556

SCORED REVERSE BUCKLING RUPTURE DISK MANUFACTURING METHOD

Loren E. Wood, Tulsa, and John W. Reynolds, Bixby, both of Okla., assignors to Black, Sivalls & Bryson, Inc., Tulsa, Okla.

Filed Jan. 2, 1975, Ser. No. 538,097
Int. Cl.² B21D *51/00*
U.S. Cl. 113—120 R **17 Claims**



1. A method of manufacturing a group of scored reverse buckling rupture disks of desired reversal rupture pressure from sheet metal comprising the following steps performed in the order recited:

a. dividing said sheet metal into a plurality of sections;

b. forming a concave-convex dome in each of said sheet metal sections;

c. annealing said sheet metal sections to relieve stresses therein;

d. forming scores on a surface of said concave-convex dome portions of said sheet metal sections thereby creating lines of weakness therein;

e. reforming said concave-convex dome portions of said sheet metal sections to increase the crown heights thereof; and

f. annealing said sheet metal sections a second time to relieve stresses therein.

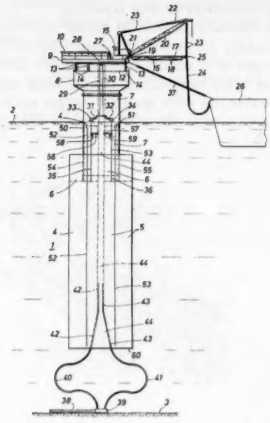
3,921,557

FLOATING STORAGE UNIT

Steven A. T. Kapteijn, and John H. Raynes, both of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 19, 1974, Ser. No. 443,541
Claims priority, application United Kingdom, Mar. 1, 1973, 9932/73
Int. Cl.² B63B *35/44*
U.S. Cl. 114—.5 T **4 Claims**

1. A storage unit adapted to float in water with a major portion thereof positioned below the waterline, in particular for storing crude oil, comprising a riser guide track extending vertically through the storage unit, a riser conduit which is axially displaceable along said riser guide track extending axially through the storage unit, a flexible hose secured to the lower end of the riser conduit and extending to the ocean floor, a hose connector guide track extending axially through the storage unit and a hose connector secured to said hose and



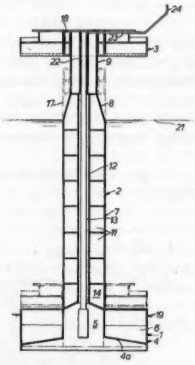
extendable along said hose connector guide track through said storage unit.

3,921,558

FLOATABLE VESSEL

Leonard Redshaw, Lancashire, England, assignor to Vickers Limited, London, England

Filed Sept. 16, 1974, Ser. No. 506,407
Int. Cl.² B63B *35/44*
U.S. Cl. 114—.5 T **10 Claims**



1. A floatable vessel comprising:

A. an upright buoyant column of relatively small cross-section;

B. a floatable ballast chamber of relatively large cross-section secured to the lower end of said column, said ballast chamber having a substantially vertical outer peripheral wall, a central portion, and a base, said base defining below substantially the entire ballast chamber means in communication with said central portion for admitting liquid into a duct over substantially the entire base area of the vessel;

C. a buoyant superstructure of relatively large cross-section slidably mounted on said column;

D. means for securing said superstructure to said column;

E. a duct positioned within said column having one end thereof extending over said vessel and the other end in

communication with said central portion of said ballast chamber;

F. liquid storage means in said ballast chamber; and

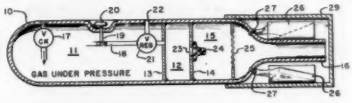
G. means for admitting liquid from said duct into said liquid storage means.

3,921,559

ACTIVE TORPEDO DECOY AND SONAR TARGET

William Eugene Wells, Sr., Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1962, Ser. No. 204,669
Int. Cl.[2] F42B *19/00*
U.S. Cl. 114—20 **4 Claims**



1. A self-propelled underwater attack deviation device comprising in combination

a cylindrical casing adapted for launching from a submerged submarine,

a jet propulsion plant within said casing and having a discharge nozzle at its downstream end through which passes jet propulsion gaseous discharge,

said discharge nozzle extending beyond and being of smaller cross section than said casing,

a removable end cap telescoped onto said casing in enclosing relation to said discharge nozzle and adapted to be readily removed therefrom by the gaseous discharge from said nozzle,

a flexible strip of acoustical reflecting material packaged between said nozzle and said end cap and having one end secured to said casting,

said strip being so packaged that it streams behind the device upon forward movement of the device through the water after removal of said end cap, and

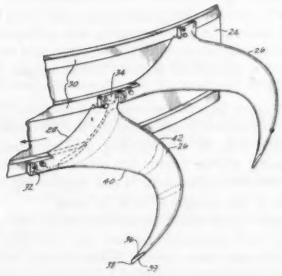
means responsive to hydrostatic pressure for activating said propulsion plant when the device is launched under water.

3,921,560

ICE CUTTING APPARATUS FOR VESSELS OPERATING IN ICE COVERED WATERS

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Apr. 8, 1974, Ser. No. 459,028
Int. Cl.[2] B63B *35/12*
U.S. Cl. 114—41 **7 Claims**



1. An ice cutter for cutting a path for a vessel through surface ice, comprising:

an elongated cutter shaft,

means rotatably supporting the shaft from the vessel, the shaft extending above and below the surface ice,

a plurality of radial ice cutter arms supported by and projecting from the shaft,

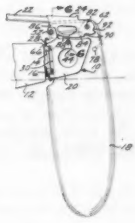
and means carried by the vessel for rotating the shaft and associated ice cutter arms about an axis of rotation, the cutter arms terminating at the outer ends thereof in cutting edges adapted to engage and chip the surrounding ice, the radial cutter arms having a leading edge and a trailing edge, the top surface of each cutter arm being inclined between the leading edge in a tangential direction, the trailing edge being higher than the leading edge as measured in a direction parallel to the axis of rotation so that the water is deflected upwardly in a direction parallel to the axis of rotation by the inclined surface.

3,921,561

BIASED KICK-UP RUDDER APPARATUS FOR BOATS

Henry L. Arce, San Juan Capistrano, Calif., assignor to Coast Catamaran Corporation, Irvine, Calif.

Filed Jan. 10, 1975, Ser. No. 540,140
Int. Cl.[2] B63H *25/06*
U.S. Cl. 114—165 **11 Claims**



1. Biased kick-up rudder apparatus comprising:

pivot means adapted to be mounted to a boat stern for pivotal movement about a generally vertical axis;

a rudder mounted to said pivot means for pivotal movement about a generally horizontal first axis, between a lowered position and a raised position;

a tiller including camming means and mounted to said rudder for pivotal movement about a generally horizontally second axis; and

bias means operative upon said rudder, said pivot means and said tiller to forcibly bias said camming means and said pivot means together and thereby resiliently hold said rudder and tiller in various pivoted positions relative to said first and second axes, respectively.

3,921,562

SELF-DEPRESSING UNDERWATER TOWABLE SPREAD

Raymond E. Kelly, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 10, 1962, Ser. No. 230,032
Int. Cl.[2] B63B *21/54*
U.S. Cl. 114—235 B **1 Claim**

1. An underwater towable spread adapted to ride through a seaway at a predetermined depth when towed at a selected speed comprising in combination,

a non-buoyant tow cable having a distal end

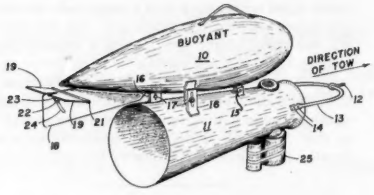
and a buoyant towable assembly connected at its forward end to the distal end of said cable,

said assembly consisting of

an elongated non-buoyant instrumentality having a longitudinal axis,

an elongated float member streamlined for motion along its longitudinal axis,

means rigidly securing said float member to said instrumentality in laterally spaced relation and with their respective axes substantially parallel,



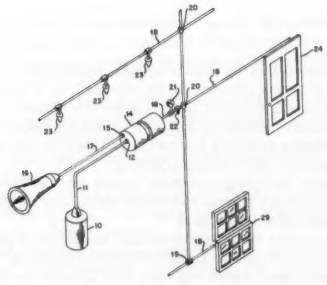
said assembly being constructed and proportioned so that while the spread is at rest, the assembly floats at the water surface, its center of gravity is spaced below and forward of its center of buoyancy with respect to said axes and aft of said tow connection thereby giving roll stability and a static trim by the head, and while the spread is towed at the selected speed the assembly submerges to ride at the predetermined depth.

3,921,563

PNEUMATIC ALARM SYSTEM

Horace Gales Edwards, and James William Sealey, both of Raleigh, N.C., assignors to Fortune Development Corporation, Cary, N.C.

Filed Sept. 30, 1974, Ser. No. 510,228
Int. Cl.² G08B *1/04, 13/00*
U.S. Cl. 116—65 **9 Claims**



1. An alarm system suitable for detecting an alarm condition upon the occurrence of an event and for sounding an audible alarm upon the detection of said alarm condition comprising:

a substantially fluid tight manifold;

a plurality of alarm condition detector means positioned proximate said manifold and arranged to interrupt said fluid tight condition upon detecting an alarm condition;

means for pressurizing said manifold;

a supply of pressurized fluid;

a fluid operated audible alarm;

a balance valve means connected to said manifold for providing fluid communication between a first and a second port in a wall of said value means when said valve is in a first state and including pressure responsive means for interrupting fluid communication between said first and second ports when said valve is in a second state;

means for connecting said supply of pressurized fluid to said first port;

means for connecting said audible alarm to said second port; and

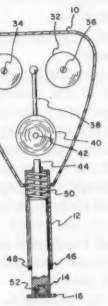
said pressure responsive means being within said balance valve means connected to said manifold for maintaining said valve in its said second state as long as said manifold pressure exceeds a predetermined value and permitting said valve to assume its said first state when said manifold pressure is below said predetermined value whereby said audible alarm is sounded.

3,921,564

PORTABLE BURGLAR ALARM

Harry Aloysious Murray, 146 Red Stone Ridge, Delran, N.J. 08075

Filed Oct. 23, 1974, Ser. No. 517,080
Int. Cl.² G08B *13/08*
U.S. Cl. 116—82 **9 Claims**



1. A portable burglar alarm for detecting the unauthorized movement of a moveable surface, said burglar alarm comprising:

a housing having substantial weight;

a bell located within said housing;

a spring driven motor located within said housing;

a clapper connected to said spring driven motor for striking said bell when driven by said spring driven motor;

a supporting leg connected to said housing;

a moveable arm located within said supporting leg, one end of said moveable arm engaging said spring driven motor for preventing operation thereof when said moveable arm supports a substantial portion of the weight of said housing; and

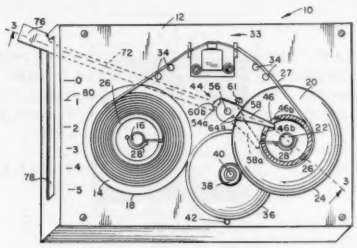
a spring means located between said one end of said moveable arm and said supporting leg and in contact with said moveable arm for disengaging said moveable arm from said spring driven motor for allowing operation thereof when said moveable arm is not supporting a substantial portion of the weight of said housing;

said burglar alarm being positioned such that said housing contacts said moveable surface and the other end of said moveable arm rests upon a fixed surface, said bell being sounded when movement of said moveable surface relative to said fixed surface causes dislocation of said other end of said moveable arm such that said moveable arm no longer supports a substantial portion of the weight of said housing.

3,921,565
TELEPHONE ANSWERING MACHINE MESSAGE RECEIVED AND FOOTAGE INDICATOR

Peter J. Totino, West New York, N.J., assignor to Quasar Microsystems, Inc., Brentwood, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,322
Int. Cl.² G01D 13/22
U.S. Cl. 116—114 J 12 Claims



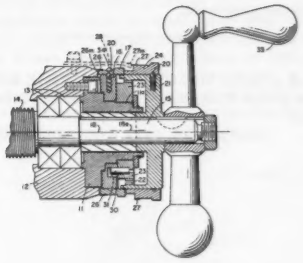
1. In tape drive apparatus, a message received and footage indicator comprising a take-up reel for receiving and accumulating tape with recorded messages thereon, said take-up reel having a central cylindrical portion about which the tape is wound which is provided with a circumferential slit disposed in a plane substantially normal to said axis about which said take-up reel rotates; feeler means mounted proximate to said take-up reel and mounted for pivotal movement in the plane of said slit; indicator means coupled to said feeler means; and biasing means for moving said indicator means to a first position when said slit is exposed and said feeler means enters the same, said indicator means moving to a discreet second position against the action of said biasing means when said slit is covered by at least one layer of tape and said feeler means is prevented from entering into said slit, said second position signifying that at least one message has been received and said take-up reel has moved from a totally unwound condition to at least a partially wound condition, said indicator means gradually and continuously moving in a direction beyond said second position against the action of said biasing means when additional tape is wound on said take-up reel and said feeler means is displaced by the increased accumulation of tape about said central cylindrical portion, the position to which said indicator moves beyond said second position providing an indication of the extent to which recorded tape has been wound onto said take-up reel; said indicator means including a cam actuator having an adjustable stop engageable with said feeler means, said adjustable stop fixing the angular position of said indicator means at a predetermined angular position relative to said feeler means, whereby the precise initial position of said indicator means may be selected from which tape footage can be measured.

3,921,566
INCH-METRIC DIAL

Ernest Wildhaber, Rochester, N.Y., assignor to Bird Island, Inc., Boston, Mass.

Filed Sept. 20, 1973, Ser. No. 399,162
Int. Cl.² B23Q 17/00
U.S. Cl. 116—115.5 2 Claims

1. An inch-metric dial assembly for use in connection with a rotary drive member, comprising
- a first dial-bearing member mountable for rotation with said drive member,
- a second dial-bearing member,
  - one of said dial-bearing members carrying a metric dial, the other an inch dial, and
- a geared connection effectively connected between said dial-bearing members to cause them to rotate at a predetermined ratio such as to cause said dials to respectively indicate metric and inch measurements exactly corresponding to the rotation of said drive member, said connection including a single pair of gears having different numbers of teeth for attaining said ratio in a single mesh, one of said gears having 127 teeth, the other of said gears having either 125 or 120 teeth,

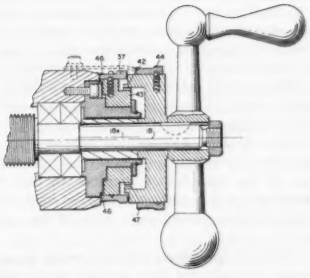


said gears being respectively internal and external gears mounted for rotation about spaced parallel axes with each of said gears surrounding both said axes, said gears being constructed and arranged for meshing relative to a pitch circle of diameter larger than the diameter of the internal gear teeth.

3,921,567
INCH-METRIC DIAL

Ernest Wildhaber, Rochester, N.Y., and Howard G. Chapman, Mattapoisett, Mass., assignors to Bird Island, Inc., Boston, Mass.

Filed Sept. 20, 1973, Ser. No. 399,163
Int. Cl.² B23Q 17/00
U.S. Cl. 116—115.5 1 Claim



1. An inch-metric dial assembly for use in connection with a rotary drive member, comprising
- a first dial-bearing member mountable for rotation with said drive member,
- a second dial-bearing member,
  - one of said dial-bearing members carrying a metric dial, the other an inch dial, and
- a geared connection effectively connected between said dial-bearing members to cause them to rotate at a predetermined ratio such as to cause dials to respectively indicate metric and inch measurements exactly corresponding to the rotation of said drive member, said connection including a single pair of gears having different numbers of teeth for attaining said ratio in a single mesh, one of said gears having 127 teeth, the other of said gears having either 125 or 120 teeth,

said dial-bearing members being mounted for rotation about different axes,

said dials being in different surfaces of revolution,

said gears being respectively internal and external gears mounted for rotation about spaced, parallel axes with each of said gears surrounding both said axes, said gears being constructed and arranged for meshing relative to a pitch circle of diameter larger than the diameter of the internal gear teeth.

3,921,568

SELF-ADHERING MEDICATION TIME REMINDER

William Joseph Fish, 8616 West 144th St., Orland Park, Ill. 60462

Filed July 25, 1973, Ser. No. 382,587
Int. Cl.² G09F *11/23*
U.S. Cl. 116—121 **1 Claim**

1. A time reminder for medication or the like and adapated for association with a container comprising:

a sub-assembly having a face and comprising a pointer member and a disc-shaped member, said disc-shaped member having a center and having markings peripherially located on one face thereof adjacent the circumferential edge thereof, said markings adapted to designate intervals of time, said pointer member having a circular base plate having an integral, outer, circular, peripheral, upwardly, axially, extending flange, said flange having an integral, terminal, radially inturned lip, said lip being slightly radially elastomerically expansible to receive therethrough said disc-shaped member in assembled relationship for relative rotation therebetween about the center of the disc-shaped member so that the pointer member designates particular ones of said markings, the pointer member provides the face of the sub-assembly, and

a layer of elastomeric foam having spaced, generally parallel faces, at least one face thereof being coated with a layer of pressure-sensitive adhesive, a portion of the other face thereof being in a face-to-face detachable connection with the face of the sub-assembly, and a protective sheet member peelably adhering to the one face of the layer so that removal of the sheet member exposes the pressure-sensitive adhesive and enables attachment of the time reminder to a surface of a container.

3,921,569

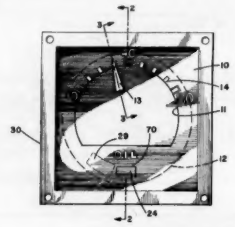
INSTRUMENTATION PRESENTATION

Arthur F. Miller, and Robert C. Schmiedel, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Nov. 8, 1973, Ser. No. 413,889
Int. Cl.² G09F *9/00*
U.S. Cl. 116—129 P **7 Claims**

1. An indicating device comprising, a dial face including an outer scale bearing member and moving means positioned behind said scale bearing member to indicate a value reading on the scale;

means to drive said indicator means, and light radiating means apart from and behind said scale and indicator means for back lighting said dial face, characterized by said moving indicator means comprising an opaque surface having a translucent portion comprising a pointer, and said



scale bearing member comprising a light conducting body having its front surface covered by an opaque material defining a translucent scale thereon, and

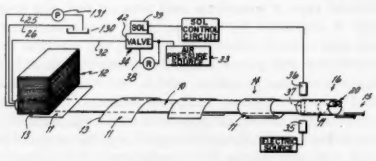
wherein the opaque surface of said moving indicator overlaps the translucent scale portion of said scale bearing member sufficiently to block light radiating directly from said light radiating means so that light from said back lighting means passes indirectly and continuously to said translucent scale by diffusion through and in the plane of the lighting conducting body of said scale bearing member.

3,921,570

APPARATUS FOR STRIPING INSIDE SEAMS OF CANS

Edwin F. Hogstrom, Sheffield, and Burton J. Vilagi, Amherst, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed July 20, 1970, Ser. No. 56,304
Int. Cl.² B05C *7/02*
U.S. Cl. 118—2 **7 Claims**



1. Apparatus for applying an impervious protective coating to the longitudinal seams of spaced cylindrical can bodies as the can bodies move through a striping station of a can body forming line over which can bodies are formed into cylinders at the rate of at least 300 can bodies per minute, which apparatus comprises

coating means for applying a continuous impervious coating of less than 1.5 milligrams per linear inch to the longitudinal seams of said can bodies, said coating means including an airless spray nozzle, means for securing the nozzle on a can assembly line in a position in which the nozzle is located interiorly of the cans and has its orifice directed toward the interior of a seam of a formed body,

means for forcing an airless spray fan of liquid coating material at a pressure of less than 600 pounds per square inch but more than 200 pounds per square inch from the nozzle orifice and directing it onto the interior surface of the seams of the can bodies.

means for starting and stopping the emission of airless spray from the nozzle orifice in synchronization with movement of the spaced can bodies past the nozzle so that the airless

spray is directed onto a seam of a can body as the body passes the nozzle orifice but it is turned off after that can body passes the nozzle orifice until the seam of the next following can body moves into alignment with the orifice, and

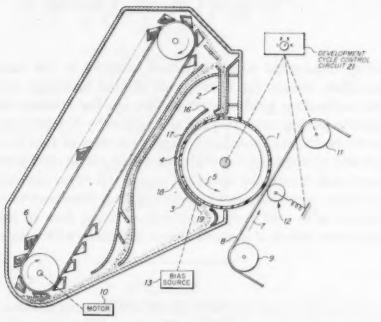
said airless spray nozzle orifice having a flow rate of less than 0.040 but more than 0.010 gallons per minute of water at 500 pounds per square inch pressure.

3,921,571

MULTIPLE DEVELOPMENT METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHIC COPIERS

Robert A. Moore, Amherst, N.H., and Daniel J. Sullivan, Hyde Park, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed June 24, 1974, Ser. No. 482,040
Int. Cl.² G03G *15/16*
U.S. Cl. 118—7 **13 Claims**



1. In an electrophotographic copying apparatus including: a first support medium carrying a latent electrostatic image to be developed thereon;

a second support medium for receiving the developed image from said first support medium;

transfer means for transferring said developed image from said first support medium to said second support medium; and,

developing means for developing said latent electrostatic image on said first support medium prior to the transfer thereof to said second support medium by said transfer means, the improvement comprising:

wherein said developing means includes control means for selectively controlling the number of times that said latent electrostatic image is developed prior to the transfer thereof from said first support medium to said second support medium by said transfer means.

3,921,572

VACUUM COATING APPARATUS

Rolf H. Brunner, Poughkeepsie; Quiedo J. Carbone, Newburgh, and William C. Lester, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,199
Int. Cl.² C23C *13/08*
U.S. Cl. 118—49.1 **6 Claims**

1. A vacuum coating apparatus comprising:

A. an evaporation chamber;

B. a coating chamber in communication with said evaporation chamber;

C. gate means reciprocally movable between an open and closed position intermediate said coating and evaporation chambers for selectively isolating each from the other;

D. a vapor source means in said evaporation chamber for generating an evaporant stream of coating material into said coating chamber;

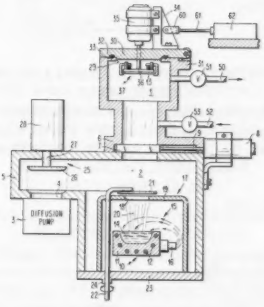
E. a port in a wall of said coating chamber for access thereto and wherein the ratio of the area of said port to the volume of said coating chamber is in the range from about 1:20 to about 1:30;

F. door means pivotally mounted on said wall for movement into open and closed positions relative to said port with said closed position securing said door means in sealing relation with said coating chamber;

G. substrate holder means mounted on an inner surface of said door means for supporting substrates in a coating position within said evaporant stream in said coating chamber;

H. means for rotating said substrates on said holder means;

I. means for maintaining said evaporation chamber under a continuous vacuum;



J. a second vacuum means for roughing a vacuum in said coating chamber when isolated from said evaporation chamber by said gate means;

K. means for isolating said second vacuum means from said coating chamber when said gate means is to be moved to the open position;

L. gas means for controllably introducing an inert gas flow in said coating chamber when isolated from said evaporation chamber, when said gate means is in the closed position, to minimize ingress of ambients into said coating chamber when said door means is in the open position; and

M. valve means for shutting off the flow of said inert gas to said coating chamber; wherein the ratio of the volumes of said evaporation chamber to said coating chamber is in the range from about **10:1** to about **30:1.**

3,921,573

CLEANING SYSTEM FOR ELECTROSTATIC REPRODUCING APPARATUS

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1973, Ser. No. 364,573
Int. Cl.² B05C *11/00*
U.S. Cl. 118—70 **3 Claims**

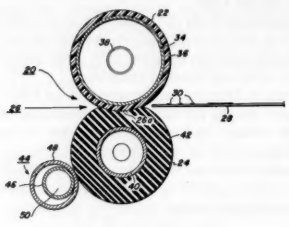
1. A thermal fuser for use in fixing toner particles to a substrate carrying such particles, said fuser comprising:

a heated fuser roll;

a backup roll member adapted to be moved in contact with said heated member and forming a nip therebetween through which said substrate is passed such that the toner particles carried by said substrate contact said heated member; and

internally heated cleaning means supported in contact with

said backup roll member for tackifying toner offset thereto, said cleaning member having a surface exhibiting



a greater affinity for said tackified toner than said backup roll member.

3,921,574

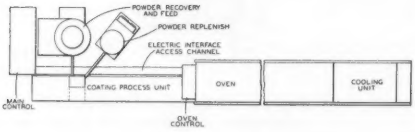
COATING METHOD WITH CLEANING AND APPARATUS THEREFOR

William P. English, Bridgeport, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Division of Ser. No. 256,294, May 24, 1972. This application Feb. 3, 1975, Ser. No. 546,547

Int. Cl.² B05C *11/02*

U.S. Cl. 118—106 **16 Claims**



1. In apparatus for producing a coating of resinous material upon only a portion of a workpiece, the combination comprising:

a. a chassis;

b. means on said chassis for removing particles of the resinous material, including a member movably mounted over a path for the workpiece and having a relatively resiliently deformable contact surface thereon of small open-cell construction;

c. means for carrying the workpiece along said travel path; and

d. drive means for said particle removing means and for said carrying means,

said contact surface being disposed for direct contact upon a portion of the workpiece as it is carried along said travel path, and said carrying means and said particle removing means being adapted for coaction to move said contact surface and the contacted portion of the workpiece at the same linear speed during such contact to substantially prevent wiping of the workpiece by said contact surface.

3,921,575

COATING APPARATUS

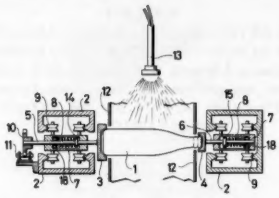
Yasunori Ishii, Ichihara; Kajime Kanbeshiyama, Tamano; Kouichi Karakawa, Chiba, and Akiharu Yamada, Tamano, all of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,701

Int. Cl.² B05B *13/02, 7/14*

U.S. Cl. 118—322 **1 Claim**

1. Apparatus for coating bottles with protective film comprising a pair of parallel guide members and a plurality of bottle holders provided in each guide member; each bottle holder comprising a housing, a horizontal spindle slidably and rotatably provided in the housing and arranged to oppose with another spindle of a housing in the opposite guide member, a first gripping member secured to the inner end of said horizontal spindle and another gripping member secured to said another spindle so as to be opposed to said first gripping member, a spring provided in the housing to urge said horizontal spindle toward said other spindle, and rollers for supporting each said housing in its guide member so that said housing may be travelled along its guide member, each said housing



being connected to an adjacent housing in the same guide member, means for moving all of said housings along their corresponding guide members, means for rotating each said spindle during travelling thereof, whereby bottles may be held in the horizontal position by opposite ones of said bottle holders and rotated during their travelling along said guide members, and means for spraying powdered resin into the region between opposed pairs of said gripping members to coat said bottles with said resin, said region being free of interfering members which if present would interfere with said spraying.

3,921,576

SPRAY BOOTH

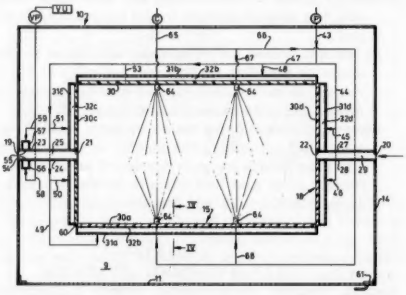
Charles R. Vertue, 2532A Wharton Glen Ave., Cooksville, Ontario, Canada

Filed Jan. 24, 1974, Ser. No. 436,236

Claims priority, application Canada, Dec. 7, 1973, 187684

Int. Cl.² B05C *11/16*

U.S. Cl. 118—634 **11 Claims**



1. A spray booth comprising:

a top, a bottom and a plurality of walls defining a spray chamber;

at least one of said walls comprising a wall panel having one side facing inwardly of said spray chamber;

said wall panel comprising a porous material;

an enclosure of gas-impervious material at the opposite side of said wall panel and secured in sealed relationship to said wall panel to form with said panel a gas chamber;

means for supplying gas under pressure into said gas chamber;

an outer housing spaced outwardly of said walls;

an opposed pair of said walls and opposed walls of said outer housing defining upwardly open openings for the

passage of a conveyed workpiece through said spray booth and through said spray chamber; and

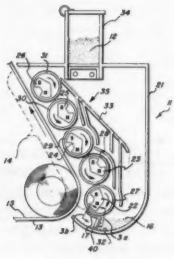
partition walls extending from the openings in said opposed spray chamber walls to said opposed outer housing walls and forming an inlet passage and an outlet passage for movement of the workpiece to and from the interior of said spray chamber.

3,921,577

MAGNETIC DEVELOPMENT UNITS

Willard L. Howard, Marion, and Thomas A. Tietjen, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,651
Int. Cl.² G03G *15/08*
U.S. Cl. 118—637 **7 Claims**



1. In a development unit for developing latent electrostatic images on a photoconductor while said photoconductor is moving through a development zone; said unit having a housing, a sump in said housing for storing a supply of developer, means communicating with said sump for adding toner to said developer, and means including at least one roll spaced from said housing for magnetically entraining and transporting developer from said sump toward said development zone; the improvement comprising a resilient baffle having one side secured to said housing and an opposite, free side with a continuous, edge-free arcuate surface biased into engagement with the developer magnetically entrained on said roll, whereby said baffle provides a seal for suppressing uncontrolled emissions of toner and also levels out any variations in the thickness of the developer magnetically entrained on said roll.

3,921,578

POWER CASCADE ELECTROPHOTOGRAPHIC DEVELOPMENT

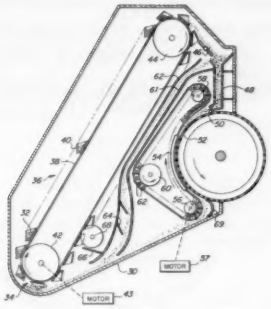
James E. Genthe, Chelmsford, and Edward F. Mayer, Acton, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed July 3, 1972, Ser. No. 268,309
Int. Cl.² G03G *13/08*
U.S. Cl. 118—637 **17 Claims**

1. A cascade development apparatus for developing an electrostatic latent image on the surface of an insulating layer with electroscopic developer containing a mixture of carrier beads and toner particles, comprising:

a. a movable member having a roughened surface positioned adjacent to at least a portion of the surface of said electrostatic latent image bearing layer to define therebetween an elongated development zone having an inlet and outlet for developer material, the development zone having a spacing between said roughened surface and said surface sufficient to allow developer material to pass therethrough, said spacing being between about 3 and about 10 carrier bead diameters;

b. means for driving said movable member upwardly with a linear velocity of at least five inches per second thereby creating between said member and said insulating surface



increased turbulence in the development zone as developer material passes therethrough; and,

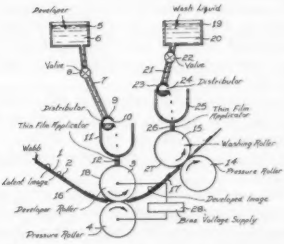
c. means for introducing developer material at the inlet of said development zone.

3,921,579

MEANS FOR RAPID DEVELOPMENT OF ELECTROSTATIC IMAGES

Robert J. Wright, Tranmere, Australia, assignor to Research Laboratories of Australia Pty. Limited, Eastwood, Australia

Division of Ser. No. 343,244, March 21, 1973. This application Sept. 30, 1974, Ser. No. 510,805
Claims priority, application Australia, Mar. 27, 1972, 8424/72
Int. Cl.² G03G *13/10*
U.S. Cl. 118—637 **4 Claims**



3. Apparatus for electrostatic recording comprising a set of vertically opposed rollers arranged in nip relation for feeding a paper web bearing an electrostatic latent image, means affording a reservoir for a liquid to be applied to the web, said reservoir being positioned above the rollers, and a distributor means for transferring liquid from the reservoir to the upper one of the rollers in a controlled thin-film form to avoid excessive wetting of the web, said distributor means comprising:

a. a receiving trough positioned above the related upper roller and having a porous wiper blade communicating therewith and extending through the bottom thereof and into contact with the upper roller to meter liquid thereto;

b. a distributor vessel operatively associated with the receiving trough for holding a supply of liquid transferred from the related reservoir, said vessel having an overflow slot therein for substantial drop-wise distribution of liquid into said trough and to the wiper blade;

c. a conduit for transferring liquid by gravity flow from the reservoir to the related distributor vessel; and

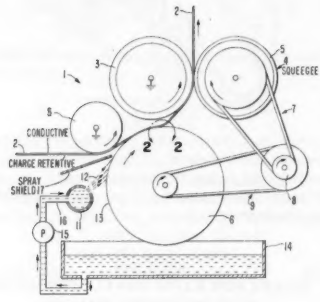
d. an adjustable valve in said conduit to control the rate of transfer of liquid from the reservoir to said distributor vessel.

3,921,580

LIQUID DEVELOPMENT OF ELECTROSTATIC IMAGES

Heino Kase, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed June 12, 1974, Ser. No. 478,813
Int. Cl.² G03G *15/10*
U.S. Cl. 118—637 **10 Claims**



1. In an apparatus for developing electrostatic images on a charge retentive surface:

development electrode means having a rough cylindrical surface comprising a plurality of discrete projecting surface portions, separated from one another by a plurality of recessive surface portions;

means for mounting said development electrode means for rotation about its axis of revolution;

means for passing the charge retentive surface of a recording medium, for bearing latent charge images thereon to be developed, adjacent said rough surface of said development electrode and contiguous with said projecting surface portions thereof;

means for rotating said development electrode means with an angular velocity such that said rough surface of said development electrode moves at a different speed than that of the adjacent charge retentive surface to be developed; and

means for supplying liquid electrographic development toner, having electroscopic toner particles suspended in a dielectric liquid, to the rough surface of said development electrode so that the toner liquid is carried into contact with the charge images on the charge retentive surface to be developed for developing same, said liquid toner being carried within said recessive surface portions, said projecting surface portions serving to wipe liquid toner from said charge retentive surface, whereby said charge-retentive surface undergoes a plurality of successive development operations, each of said operations being followed by a wiping operation.

3,921,581

FRAGRANT ANIMAL LITTER AND ADDITIVES THEREFOR

Andrew I. Brewer, Long Beach, Calif., assignor to Star-Kist Foods, Inc., Terminal Island, Calif.

Filed Aug. 1, 1974, Ser. No. 493,518
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **19 Claims**

1. A moisture sensitive fragrance releasing solid which comprises consolidated particles of:

a perfume; and

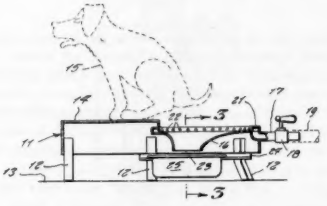
a solid excipient of powdered solids having a particle size passing about a 10 mesh standard size sieve molded into consolidated particles having a size ranging from about 1/16 to about ½inch diameter and including a binder and water sensitive disintegrant in an amount sufficient to retain the particles in a molded shape during handling, storage and use thereof and sufficient, when contacted with water, to disintegrate said particles into a powder state and release said perfume.

3,921,582

LAVATORY FOR DOGS AND OTHER DOMESTICATED PETS

Kate Sedlmeir, 135-30 82nd Drive, Jamaica, N.Y. 11435

Filed Feb. 25, 1974, Ser. No. 445,165
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **1 Claim**



1. In a lavatory for dogs and other demesticated pets, the combination of a thin-walled main body which at one end forms a horizontal platform upon which an animal squats, and a circular bowl at its other end into which said animal defecates, an upper edge of said bowl being at a lower elevation than said platform, a peripheral, downward extending wall around said main body, a circular opening in a bottom of said bowl, said bowl having a side wall that is inwardly concaved, so an upper portion thereof is more horizontal than a lower portion, said bottom opening being on a vertical axis that is disaligned with a vertical axis of an upper end of said bowl whereby said inwardly concaved wall has a longer said horizontal portion at one end and a shorter relative horizontal portion at a diametrically opposite end, said shorter relative horizontal portion being adjacent said other end of said platform, means to flush said bowl side wall comprising an integral peripheral channel means around said upper edge of said bowl, said channel being connected to a water supply pipe, a plurality of openings along an inner peripheral wall of said channel for flushing water, a hand valve on said pipe, said main body being mounted upon legs, a lower edge of said main body having a pair of parallel, spaced apart track rails, and a removable receptacle having a sideward flange around an upper edge that is slidable upon said rails between a position under said bowl bottom opening and an end edge of said main body for removal.

3,921,583

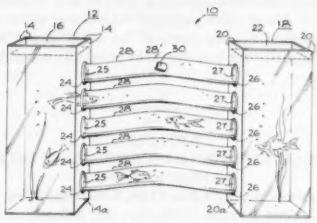
MODULAR AQUARIUM SYSTEM

Robert E. De Shores, 3476 Barbara St., San Pedro, Calif. 90731

Continuation-in-part of Ser. No. 307,431, Nov. 17, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,315
Int. Cl.² A01K *64/00*
U.S. Cl. 119—5 **5 Claims**

2. A modular aquarium system comprising at least two transparent tanks spaced horizontally apart in a preselected arrangement, the tanks being open adjacent the top to atmosphere, at least one transparent tube lying entirely below the upper ends of the tanks and providing communication be-

tween the tanks for gravity maintenance of water and passage of fish from one tank to the other; detachable means connecting opposite ends of the tube to the respective tanks whereby the system may be dismantled for cleaning or for modifying the arrangement, said detachable means being comprised of a nipple mounted in a wall of each tank and extending outwardly therefrom; means formed adjacent the ends of the tube for mating with the nipples; coupling members adjacent the tube ends for drawing the means adjacent each end of the tube into juxtaposition with the respective nipples; the nipples each having a generally L-shaped cross section terminating in a



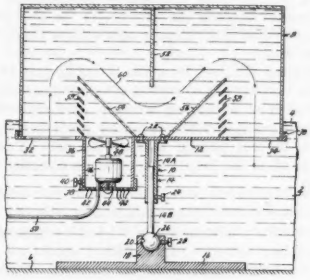
flange spaced from the inner surface of the tank wall and presenting outward engagement annular seats; an annular seal on each nipple in the space between the tank wall and nipple flange, each nipple having external threads; a first nut having internal threads engaged with each nipple and in abutment with the tank wall and tightening the seal between the tank wall and the nipple; the means formed adjacent the ends of the tube being flanged sleeves sealingly secured thereto and having faces mating with the annular seats of the nipples; and the coupling members being second nuts threadedly engaging the threads on the nipples and bearing against portions of the flanges on the sleeves facing away from the tank.

3,921,584

FISH DISPLAY DEVICE

William J. Scantlin, 4136 N. Kansas St., Kansas City, Mo. 64117

Filed Aug. 22, 1974, Ser. No. 499,532
Int. Cl.² A01K *63/00*
U.S. Cl. 119—5 **4 Claims**



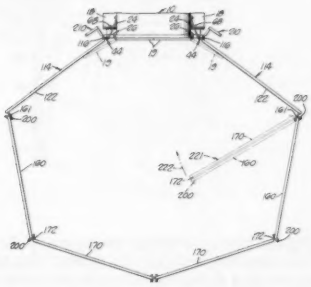
1. A fish display device comprising:
a. a hollow, transparent body member open at its bottom but otherwise sealed, and adapted to contain water,
b. supporting means operable to support said body member in a larger body of water so as to project above the surface of said water body but extending beneath said surface, whereby water in the elevated portion of said body member is retained therein by atmospheric air pressure, said supporting means including a tray engageable by the bottom of said body member and having two spaced apart apertures formed therethrough, whereby the interior of said body member forms a path along which fish entering said body member from said water body through one of said tray apertures may swim through said body member to and outwardly through the other of said tray apertures, and
d. water impellor means carried by said supporting means and operable to produce a current of water inwardly into said body member through one of said tray apertures and outwardly from said body member through the other of said apertures.

3,921,585

FOLDING TRAILER CORRAL

Mary Irene Hall, 10320 Sunland Blvd., Sunland, Calif. 91040

Continuation-in-part of Ser. No. 359,352, May 11, 1973, abandoned. This application May 10, 1974, Ser. No. 468,654
Int. Cl.² A01K *1/00*
U.S. Cl. 119—20 **7 Claims**



1. In a combination of the class described:
a. a vehicle adapted to carry animals and having an ingress and egress opening;
b. mounting brackets secured to said vehicle on opposite sides of said opening;
c. two foldable corral-forming units, one pivoted to one of said mounting brackets on each side of said opening, each of said units having a plurality of fence sections hingedly connected together and adapted to fold along the side walls of said vehicle, said fence sections also being adapted to be unfolded in order to form a corral area adjacent said vehicle and connected to said opening of said vehicle; and
d. a securing bracket pivotally mounted on at least one of said mounting brackets, the pivot of said securing bracket being in substantial alignment with the pivots of said foldable units, said securing bracket being movable into a position encompassing portions of one of said foldable units when they are in folded position to secure the sections of said unit so that said sections will all pivot together, said folded sections and said securing bracket thereafter being swingable on a common pivot.

3,921,586

CROWD GATE FOR MILKING PARLOR HOLDING AREAS

Raymond G. Sweeney, Walworth, Wis., and Michael M. Thyberg, Bismarck, N. Dak., assignors to Chromalloy American Corporation, New York, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,823
Int. Cl.² A01K *1/02*
U.S. Cl. 119—20 **13 Claims**

1. Crowd gate means for a cattle holding area which has an entry at one end and an exit to a milking parlor at the opposite end, said crowd gate means comprising, in combination:

parallel overhead tracks extending from end to end of the holding area;

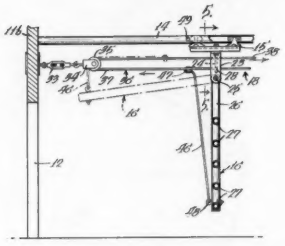
carriages supported on said tracks, said carriages having brackets;

a gate pivotally suspended on said brackets on a horizontal axis, said gate being substantially the width of the holding area;

drive means including an overhead cable for moving said gate from end to end of the holding area and a reversible electric motor drivingly connected to the overhead cable;

an electric control circuit including first switch means having first open contacts, and means for closing said first open contacts to cause the motor to drive the gate toward the entry end of the holding area;

connecting cable means which has one end connected to the overhead cable between the gate and the entry end of the holding area, the other end of said connecting cable means being connected toward the bottom of the gate;



blocking means for blocking movement of the carriages toward the entry end, said blocking means being spaced from the entry end by a distance which is slightly greater than the distance from the pivot axis to the bottom of the gate,

whereby when movement of the carriages is blocked the overhead cable continues to move and pulls the connecting cable to pivot the gate upwardly toward the entry end;

means for stopping the drive of the overhead cable when the leading end of the lifted gate is near the entry end of the holding area;

and second switch means in the control circuit having second open contacts, and means for closing said second open contacts to cause the motor to drive the overhead cable for moving the gate toward the exit end of the holding area, initial movement of the overhead cable toward said exit end releasing the pull on the connecting cable means so the gate returns to an upright position.

3,921,587

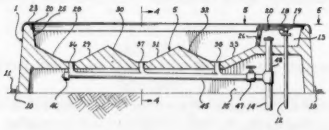
SELF CLEANING WATER TANK FOR BOVINE ANIMALS

William E. Schnee, 1521 E. 3rd Place, Mesa, Ariz. 85104

Filed Dec. 16, 1974, Ser. No. 532,849

Int. Cl.² A01K 7/02

U.S. Cl. 119—78 **9 Claims**



1. A self filling and self cleaning water tank for animals, ncluding a source of water connected to a water fill pipe and ı drain pipe for draining said tank, said water tank comprising:

ı. regulating means for periodically directing a flow of water rom the water fill pipe into said tank commensurate with the vater level within said tank;

b. a water discharge pipe connected to the water fill pipe and located adjacent the upper interior edge of said tank for discharging water into said tank commensurate with the operation of said regulating means, said water discharge pipe including a plurality of apertures disposed therealong for discharging the water adjacent the interior sides of said tank to wash said interior sides;

c. an undulating bottom surface for urging any sediment and debris within the water to gravitate toward the troughs of said bottom surface;

d. a drain disposed at each of the troughs of said bottom surface;

e. a drain pipe interconnecting each of said drains; and

f. a quick dump valve disposed within said drain pipe for discharge of at least some of the water within said tank and the sediment and debris in proximity to each of said drains.

3,921,588

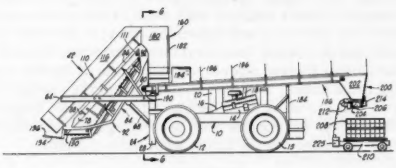
METHOD AND APPARATUS FOR HARVESTING DOMESTIC FOWL

Lloy W. Ledwell, Jr., P.O. Box 1106, Texarkana, Tex. 75501

Filed July 26, 1974, Ser. No. 492,348

Int. Cl.² A01K 29/00

U.S. Cl. 119—82 **20 Claims**



1. A method of harvesting fowl comprising:

moving a plurality of substantially horizontally extending lifting fingers through an endless path, a portion of which is adjacent a surface upon which the fowl are standing, to project and extend said fingers beneath the fowl;

raising and pivoting the fingers immediately after their extension beneath the fowl to lift the fowl and support them on the fingers and a cooperating supporting structure; and

transferring the fowl from the lifting fingers to a substantially horizontally extending conveying surface to convey the fowl to a cooping location, said movement of the fingers being carried out at one point during the movement thereof through said endless path to concurrently move all of the fingers in a common direction toward the fowl.

3,921,589

ANIMAL TETHERING APPARATUS

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

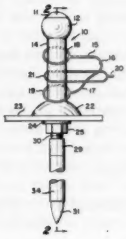
Filed Oct. 30, 1972, Ser. No. 302,218

Int. Cl.² A01K 3/00

U.S. Cl. 119—121 **12 Claims**

1. An animal tethering device comprising a tubular rod, a knob on top of said tubular rod, a disc means, a spacer member between said disc means and said tubular rod, a ground rod means for insertion into the earth, means holding said tubular rod, knob, disc means, ground rod means, and spacer member together, a clevis member for receiving an animal tethering line, a pair of spaced eyes on said clevis member

encircling said tubular rod with sufficient space between said eyes and said tubular rod to pass the bight of an animal tether-



ing line whereby said clevis member is rotatable around and up and down on said tubular member.

3,921,590

FLUIDISED BED INCINERATORS

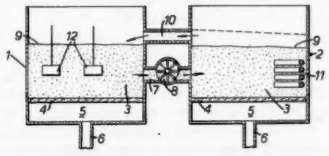
Douglas Allison Mitchell, 7 Clifton Gardens, Eaglescliffe, Stockton, Teesside, and Arnold Pearce, 32 Old Queen St., Westminster, London, SW1H 9HP, both of England

Filed Oct. 19, 1973, Ser. No. 407,773

Claims priority, application United Kingdom, Oct. 20, 1972, 48339/72

Int. Cl.² F22B *1/02*; **F23G** *7/00*

U.S. Cl. 122—4 D **4 Claims**



1. Apparatus comprising first and second beds of refractory particulate material, said beds being located in separate compartments arranged side by side in a vessel, a partition forming a common wall between said compartments and extending from a position above the lowest level of said particulate material to a position above the normal upper surfaces of said particulate material, separate means for fluidising the two beds, the means for fluidising the first bed being arranged to fluidise the bed in a non-uniform manner to cause a greater degree of agitation of the bed adjacent said partition than away from said partition, thereby promoting circulation of the material in said first bed from the upper surface of said first bed which is away from said partition downwardly toward the bottom of the partition, and means associated with the second bed for raising or lowering the operating temperature of the second bed and for transferring material between the two beds.

3,921,591

PRESSURIZED-WATER COOLANT NUCLEAR REACTOR STEAM GENERATOR

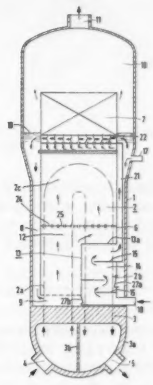
Hans Mayer, Bubenreuth, and Heinz-Jurgen Schroder, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 4, 1973, Ser. No. 366,313

Claims priority, application Germany, June 26, 1972, 2232236

Int. Cl. F22b *1/06*

U.S. Cl. 122—34 **4 Claims**



1. A steam generator including a vertical housing having lower and upper portions and having a feed-water inlet in said lower portion and a steam outlet in said upper portion and containing an inverted U-shaped nest of heat exchanger tubes forming inlet and outlet leg ends, a vertical guide jacket radially enclosing said nest and radially spaced inwardly from said housing, a feed-water preheater chamber radially enclosing said outlet leg end and connected with said feed-water inlet, and a water separator positioned above said jacket below said steam outlet and downwardly discharging separated water; wherein the improvement comprises a duct connected with said preheater to receive preheated feed-water therefrom and extending to adjacently below said water separator at a location feeding the preheated feed water directly into separated water discharged by said water separator.

3,921,592

ARRANGEMENT AND MOUNTING OF THE ENCLOSURE AND COMBUSTION CHAMBER OF A FORCED-DRAFT BOILER

Guy Edmond Calvin, Saint Maur, and Andre Marcel Costecalde, Fontenay-sous-Bois,, France, assignors to Saunier Duval, Rueil Malmaison, France

Filed Dec. 12, 1974, Ser. No. 531,888

Claims priority, application France, Dec. 13, 1973, 73.44462

Int. Cl.² F22B *15/00*; **F28F** *1/24*

U.S. Cl. 122—262 **6 Claims**

1. A forced-draft furnace comprising:

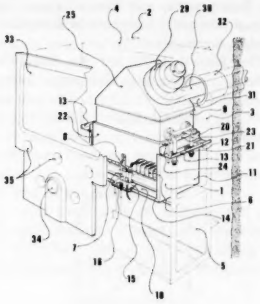
a rectangular enclosure, thhe top portion of which is substantially imperforate except for a combustion air inlet and a combustion products outlet in the back panel of said enclosure;

a U-shaped partition separating top and bottom portions of said enclosure;

resting in the lower portion of said partition, a burner;

a heat exchanger bridging said U-shaped partition, said heat exchanger being provided with a shroud including a skirt portion which extends down into the depending portion

of said partition with a predetermined gap therebetween; and



means for exhausting combustion products from said shroud through said outlet, whereby air entering said inlet passes around said shroud and through said gap between said skirt and the depending portion of said partition to said burner.

3,921,593

COOLING SYSTEM FOR THE COOLING OF THE HOUSING OF A ROTARY PISTON INTERNAL COMBUSTION ENGINE

Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

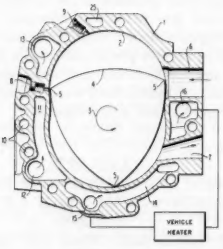
Filed Oct. 6, 1972, Ser. No. 295,481

Claims priority, application Germany, Oct. 9, 1971, 2150478

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F02B *55/10*

U.S. Cl. 123—8.01 **28 Claims**



1. A cooling system for cooling housing means of a rotary piston internal combustion engine of the type having housing means enclosing a combustion space within which a multi-lobed rotary piston rotates, the housing means including a casing means circumferentially surrounding the piston, the casing means having an inwardly facing running surface engageable with outer portions of the lobes of the piston during rotation thereof, the engine including inlet and outlet channels for respectively accommodating entry of combustible materials into the combustion space and exit of exhaust gases from the combustion space, the running surface and piston being so configured and the inlet and outlet channels being so positioned that combustion gases of differing temperatures are in contact with different circumferential portions of the running surface during operation of the engine; said cooling system comprising:

a first cooling circuit for accommodating circulation of a first cooling fluid,

and a second cooling circuit for accommodating circulation of a second cooling fluid,

said first and second circuits being separate from one another,

said first cooling circuit including a first cooling space formed in said casing means and extending adjacent a first portion of the circumference of said running surface with a cooling fluid inlet to said first cooling space positioned adjacent the circumferential portion of the running surface which is in contact with the hottest combustion gases during operation of the engine,

wherein said first cooling space extends around the circumference of said running surface in a direction opposite the rotational direction of the piston from said cooling fluid inlet to a cooling fluid outlet positioned adjacent the circumferential portion of the running surface which is in contact with the coolest combustion gases during operation of the engine.

3,921,594

INTERNAL COMBUSTION ENGINES

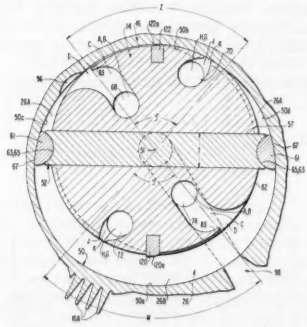
Robert Douglas Lampard, 23 Kinbrace Way, Lynwood, Australia

Filed Apr. 1, 1974, Ser. No. 456,872

Claims priority, application Australia, Apr. 3, 1973, 2865/73

Int. Cl.² F02B *53/00*

U.S. Cl. 123—8.05 **30 Claims**



1. An internal combustion engine comprising a hollow housing and an inner member therein to define a combustion chamber between the housing and inner member, mounting means for disposing the housing and inner member relatively rotatable about a longitudinal axis, said inner member having a longitudinally extending vane received therein for sliding movement transverse to said axis, said vane having opposite longitudinal surfaces which slidingly and sealingly engage an endless longitudinally extending curved outer peripheral surface of said chamber defined on said housing to divide the combustion chamber into two sections, one to either side of the vane, said sections being closed by axial end sealing surfaces associated with the chamber; sealing means within said chamber sections for dividing the chamber sections each into two separately sealed parts during periods of a cycle of relative rotation between the housing and inner member; inlet means for introducing working fluid to both parts of said chamber sections and outlet means for exhausting spent working fluid thereform, means for igniting said working fluid in a first of said parts of the chamber section, means for transferring the ignited working fluid to the second said part of the chamber section at the end of said period for that chamber section when the two parts thereof are no longer separated by

the said sealing means whereby the working fluid in such second chamber section part is ignited; and working fluid directing means for inducing circulatory movement and consequent turbulance into the working fluid in the first part of each chamber section prior to its being transferred to the second part of that chamber section.

3,921,595
ROTARY INTERNAL COMBUSTION ENGINE

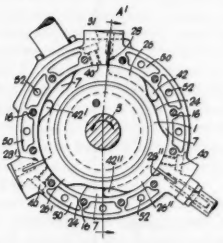
Leslie Sargeant Saunders, Sandringham, Australia, assignor to Gunther Paul Zepernick, Doncaster; Roy Herbert Watts, East Bentburg and Max Albert, East Oakburg, all of, Australia

Filed Oct. 10, 1973, Ser. No. 404,899

Claims priority, application Australia, Oct. 11, 1972, 785/72

Int. Cl.² F02B *53/08*

U.S. Cl. 123—8.23 **2 Claims**



1. A two stage rotary internal combustion engine comprising a rotor mounted for rotation on a shaft within a housing, said rotor consisting of first and second relatively fixed coaxial rotor portions, each portion having at least one radially outwardly extending lobe in peripheral sealing contact with said housing, first and second annular chambers formed by said housing and said first and second rotor portions respectively, at least one fuel inlet port within said housing communicating with said first chamber, at least one transversely extending first sealing vane resiliently mounted within said first rotor portion located adjacent to, and preceding, said inlet port, at least one ignition means associated with said first chamber for the ignition of the compressed fuel therein, located within said housing adjacent to, and preceding, said first sealing vane, at least one transfer port within said housing communicating between said first and second chambers for the transfer of combustion products from said first chamber to said second chamber located adjacent to, and preceding, said first sealing vane, at least one transversely extending second sealing vane resiliently mounted within said housing in peripheral sealing contact with said second rotor portion located adjacent to, and preceding said transfer port, at least one exhaust port within said housing communicating with said second chamber for the discharge of said combustion products from said second chamber located adjacent to, and preceding, said second sealing vane, the number of inlet, transfer and outlet ports, first and second sealing vanes and ignition means each being equal to the number of lobes on each rotor portion, the lobes of the first and second rotor portions being so shaped as to act as cams relative to their associated sealing vanes and being so disposed relative to each other that when the first rotor portion has reached the end of the compression cycle and the fuel charge has been ignited in the first chamber, the transfer port is opened by both first and second rotor portions and the second rotor portion is commencing its intake cycle to receive the expanding combustion products from said transfer port.

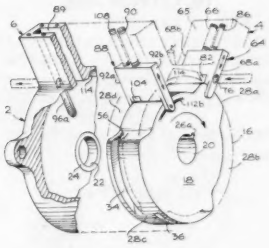
3,921,596
CONCENTRIC ROTARY ENGINE

John E. Schulz, 10707 Moorpark, Apt. 204, North Hollywood, Calif. 91602

Filed Sept. 11, 1974, Ser. No. 505,062

Int. Cl.² F02B *53/00*

U.S. Cl. 123—8.27 **30 Claims**



1. A rotary engine of the internal combustion type, comprising:

a rotor housing having an inner surface which defines a hollow, cylindrical chamber;

a rotor concentrically disposed within said cylindrical chamber and in rotatable engagement with said inner surface;

power transfer means secured to said rotor and extending beyond said housing;

said rotor having a perimetrical cam surface which defines, in the direction of axial rotation, power lobe means, inlet pocket means, operating lobe means and combustion pocket means;

a leading gate system and a trailing gate system, said leading and trailing gate systems being in correlative spaced relationship and, including, respectively, leading and trailing gate means and leading and trailing gate housings therefor, said leading and trailing gate housing being integrated with said rotor housing and in open mouth communication with the transverse width of the rotor cam surface, said leading and trailing gate means being yieldably, sealingly and slidably disposed within their respective housings for sealingly and slidably engaging the transverse width of the rotor cam surface;

combustion chamber means recessed in the inner surface of said rotor housing between said leading and trailing gate means;

operative section means delimited by the leading and trailing gate means and the combustion chamber means disposed therebetween;

intake reservoir means defined by the portion of the rotor inlet pocket means in cyclic cooperation and communication with the operative section means;

expansion receiver means defined by the portion of the rotor combustion pocket means in cyclic cooperation and communication with the operative section means;

rotor entrance means in said operative lobe for conveying fluid to said intake reservoir means and rotor exit means in said operating lobe for withdrawing fluid from said expansion receiver means;

said leading gate system comprising intake passage means cooperating with said rotor entrance means for selectively admitting fluid into said rotor entrance means;

said trailing gate system comprising exhaust passage means cooperating with said rotor exit means for selectively exhausting fluid from said rotor exit means;

means for withdrawing fluid compressively entrapped between the power lobe means and the leading gate means when the leading gate means is in spaced relationship to the combustion chamber means; and

means for initiating combustion of combustible fluid in said combustion chamber means.

3,921,597

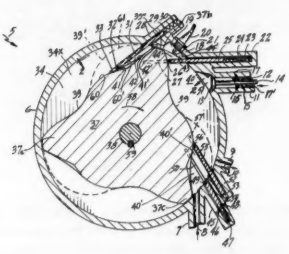
ROTARY INTERNAL COMBUSTION ENGINE

Salvatore M. Franco, 323 E. 10th St., New York, N.Y. 10009

Filed Mar. 18, 1974, Ser. No. 451,853

Int. Cl.² F02B *53/08*

U.S. Cl. 123—8.31 **4 Claims**



1. An internal rotary combustion engine comprising in combination: a motor casing means defining a casing recess, and a space of circular shape in a transverse cross-section across the casing means; an axis structure means extending axially of the circular shape and concentric thereto within the casing means; chamber-defining rotary structure means mounted on the axis structure means for rotation in the plane of the circular shape, within the space and having rotation structure defining at least two separate chamber-forming recesses extending radially inwardly from a radially-outwardly-directed face such that for each recess a chamber space is defined between the rotation structure and the inner circular wall of the casing means as part of the circular space of the casing means, one of said chamber-spaces being a first compression chamber space and another of said chamber-spaces being a second combustion chamber spaced in juxtaposition to and spaced from and in following sequence to the first compression chamber space, positioned a first predetermined distance along the radially-outwardly-directed face, the motor casing means providing a conduit channel for fluid communication between the first compression chamber-space and the second combustion chamber-space, the first and second chamber-spaces having the recessed walls radially inwardly angularly-extending in an inclined plane from said radially-outwardly-directed face in a gradual slope at at-least an end of the first compression chamber closest to and preceeding the second combustion chamber-space, the motor casing means including spaced around the inner surface thereof a fuel inlet-port-defining structure and spaced therefrom an exhaust port; an ignition means mounted in at least one of the motor casing means and the rotary structure means for igniting fluid fuel within the second combustion chamber at a predetermined point of rotation of the rotation structure when rotated such that said combustion chamber has communicated with said casing recess; and baffle means for compressing fluid of said first compression chamber-space into said second combustion chamber-space and providing at least a substantially radially-inwardly reciprocatable first wall-baffle mounted in and extending from an inner wall of the casing means in a plane about parallel to the axis structure means and transversely to the circular shape, and the wall-baffle being rideable flushly at its distal terminal end sealably against and along said radially-outwardly-directed face at points removed from said recesses and sealably against said inwardly angularly-extending recessed walls of said compression chamber, the first wall-baffle being located in juxtaposition to and at a leading edge of said casing recess, said baffle means providing at least a substantially radially-inwardly-reciprocatable second wall-baffle mounted in and extending from the inner wall of the casing means in a plane about parallel to the axis structure means and transversely to the circular shape and rideable flushly at its distal terminal end sealably against and along said inwardly angularly-extending recessed walls of the combustion chamber-space, said combustion chamber recess and said wall-baffle being of a substantially common and same width and of a lesser width than said first wall-baffle, the second wall baffle being located in juxtaposition to and at a trailing edge of the casing recess.

3,921,598

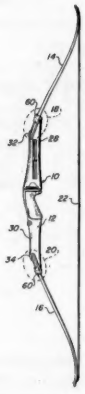
TAKEDOWN BOW LIMB-HANDLE ASSEMBLY

James C. Helmick, Grayling, Mich., assignor to Victor Comptometer Corporation, Chicago, Ill.

Filed Oct. 15, 1973, Ser. No. 406,244

Int. Cl.² F41B *5/00*

U.S. Cl. 124—24 R **12 Claims**



9. A takedown-type archery bow comprising: a handle member and limb members removably mounted thereon to hold a bowstring in an assembled position, of said limb having members:

a flat elongated limb support and load bearing abutment surface on the end of said handle member facing forwardly away from the bowstring and inclined relative thereto and having a forwardly facing outer end surface portion and a forwardly facing inner end surface portion, flange means for retaining said limb member on said handle member and being fixedly mounted on said handle member in spaced overlying relationship to the forwardly facing inner end surface portion and providing a rearwardly facing limb support and abutment surface spaced from and extending generally parallel to and overlying the forwardly facing inner end surface portion and defining a limb receiving socket therebetween of generally rectangular cross sectional configuration and confiningly slidably abuttingly receiving the innermost portion of said limb member in the assembled position,

limb abutment means for retaining said limb member on said handle member and protruding into said limb receiving socket between said flange means and the inner end surface portion and being centrally located therewithin, band means for retaining said limb member on said handle member and being fixedly mounted on said handle member and spaced longitudinally outwardly from said flange means in juxtaposition to the outer end surface portion and having a first fixedly mounted wall portion providing a flat abutment surface spaced from and generally parallel to and overlying the outer end surface portion and having a pair of spaced parallel transverse con-

necting wall portions fixedly fastened to said handle member,

said band means and the outer end surface portion defining a limb receiving slot of generally rectangular cross-sectional configuration generally corresponding in cross-sectional configuration to the limb receiving socket and slidably confiningly receiving said limb member in the assembled position,

each of said limb members having inner end mounting portions of generally rectangular cross-sectional configuration generally corresponding in cross-sectional configuration to the limb receiving socket and to the limb receiving slot and providing a first generally flat rearwardly facing abutment surface and a second generally flat forwardly facing abutment surface corresponding in size and shape to the flat elongated limb support and abutment surface on said handle member,

notch means for retaining the limb members on said handle member and being located on the inner end portions of each of said limb members and generally corresponding in size and shape to said limb abutment means and abuttingly received thereabout in the assembled position with said first generally flat forwardly facing surface on said handle member slidably abuttingly received on said first generally flat rearwardly facing abutment surface on said limb member in load bearing relationship therewith and with said second generally flat forwardly facing abutment surface on said limb member slidably abuttingly received on said rearwardly facing limb support surface on said flange means in load bearing relationship therewith and being confined by said first fixedly mounted wall portion of said band means, and

releasable detent means for retaining said limb members on said handle members and being located on said band means and on said inner end portion of said limb members and being cooperably engaged in the assembled position to releasably hold said limb members in load bearing relationship with said handle member in the assembled position.

3,921,599

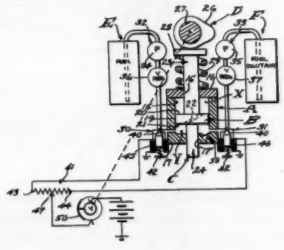
FUEL PUMP INJECTION FOR COMPRESSION IGNITION ENGINES

Harlow B. Grow, Pacific Palisades, Calif., assignor to Craig H. Grow, Pacific Palisades; Bruce W. Grow, Manhattan Beach, both of Calif.; part interest to each.

Filed Apr. 21, 1972, Ser. No. 246,318

Int. Cl. F02d *19/00*

U.S. Cl. 123—25 A **11 Claims**



1. Full stroke fuel pump injection for a compression ignition engine having a combustion chamber, and including: a pump body having closed dual chambers therein, a transfer chamber and a storage chamber, there being restricted fluid communication between the transfer chamber and the storage chamber; differentially sized fluid displacement rams entering into the said transfer chamber and storage chamber to reversely change the volumetric displacements thereof respectively; means reversely reciprocating the said fluid displacement means into said transfer and storage chambers in timed relation to cycling of the engine; a metered fuel supply means and a metered fuel dilutant supply means both opening into the said transfer chamber and charging the same with fuel and fuel dilutant respectively in proportionate quantities and in timed relation to cycling of the engine; and nozzle means opening from the said transfer chamber and into the combustion chamber of the engine.

3,921,600

CIRCULATING COOLING SYSTEM FOR PISTON INTERNAL COMBUSTION ENGINES

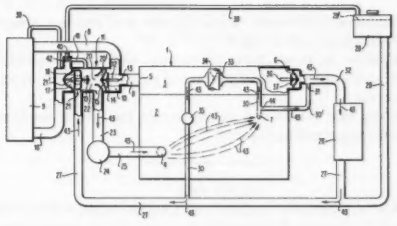
Richard Henning, Munich, and Erwin Schweiger, Dachau, both of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Germany

Filed Mar. 22, 1974, Ser. No. 453,807

Claims priority, application Germany, Mar. 22, 1973, 2314301

Int. Cl.² F01P *3/22*

U.S. Cl. 123—41.54 **25 Claims**



1. A circulation cooling installation in an internal combustion engine which includes cooling jacket means and control means operable to interrupt the cooling medium circulation through the cooling jacket means at least within the area of the combustion zones up to a first predetermined limit value after the cold start of the engine, above the first predetermined limit value to confine the cooling medium circulation at first to a closed circulation by-passing a radiator means and avoiding a fresh water exchange, and above a further predetermined limit value include into the cooling medium circulation, the radiator means and at least one of the two parts consisting of heater heat-exchanger means and fresh water exchange, characterized by vent line means which are arranged between vent connections of at least some of the parts consisting of radiator means, thermostat housing means, cooling jacket means, cooling valve means and an expansion tank means, said vent line means being operable to be closed off by at least one float valve means controlled by the level of the cooling medium for preventing circulation of the cooling medium through said vent line means.

3,921,601

ROTARY MACHINE

Eliahou Maoz, Vaduz, Liechtenstein, assignor to Setec Societe d'estudes Techniques Anstalt, Vaduz, Liechtenstein

Filed Apr. 6, 1973, Ser. No. 348,618

Claims priority, application United Kingdom, Feb. 22, 1973, 8797/73; Feb. 27, 1973, 9582/73

Int. Cl.² F02B *57/06, 57/08*

U.S. Cl. 123—44 E **17 Claims**

1. A rotary machine comprising:

a stator;

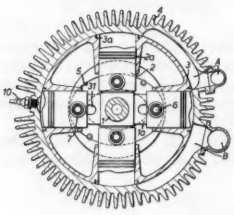
a piston;

a cylinder block;

an outwardly extending piston rod guide being fixed to an output shaft of said machine;

said piston and said cylinder block being capable of rotation together relative to said stator;

said piston being reciprocably movable within said cylinder block;
a cam on said stator;
a cam follower on said piston;
said cam and said cam follower relating said reciprocable movement of said piston within said cylinder to said



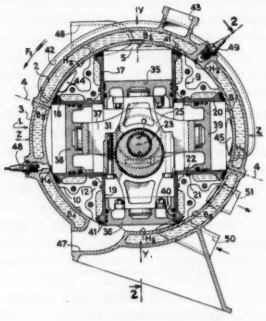
rotational movement of said piston and piston cylinder block combination; and
said piston in its reciprocable motion within said cylinder being slidable over said piston rod guide which is received therein,
whereby said piston rod guide carries the lateral loads of said reciprocating piston.

3,921,602

ROTARY CYLINDER INTERNAL COMBUSTION ENGINE

Armand Froumajou, Pontoise, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Jan. 15, 1975, Ser. No. 541,326
Claims priority, application France, Jan. 24, 1974, 74.02390
Int. Cl.² F02B *57/04*
U.S. Cl. 123—44 D **8 Claims**



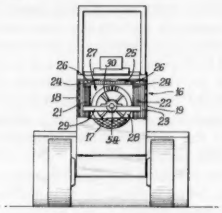
1. In a four-stroke internal combustion engine comprising a stator having induction and exhaust ports, a rotor mounted to rotate in the stator and defining with the stator cylinders, a crankshaft mounted to rotate in the stator, pistons slidably mounted in the cylinders and connected to the crankshaft, and a transmission device interposed between the crankshaft and the rotor to produce between the crankshaft and the rotor a given relative speed of rotation; the provision in the stator of additional ports comprising an inlet port and a delivery port, with which additional ports each piston and corresponding cylinder are cooperable in the course of a part of each revolution of the rotor for performing a pumping function.

3,921,603

CENTRIFUGAL FAN COOLING SYSTEM

Erwin J. H. Bentz, Washington; Marvin G. Getz, Morton, and Roger A. Stapf, Dunlap, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 18, 1974, Ser. No. 452,117
Int. Cl.² F01P *11/08*
U.S. Cl. 123—41.33 **5 Claims**



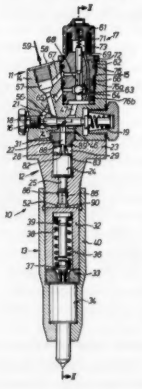
3. A cooling arrangement for a vehicle comprising:
a plurality of radiators including at least an oil cooling radiator and an engine coolant cooling radiator;
a centrifugal fan mounted for rotation about an axis;
at least one of said radiators vertically disposed on one side of said fan in a plane generally parallel to the axis of said fan;
another of said radiators horizontally disposed above said fan in a plane generally parallel to the axis of said fan; and
said radiators being arranged around said fan to at least partially enclose same so that air from said fan is forced through all said radiators substantially evenly.

3,921,604

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Heinz Links, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 30, 1972, Ser. No. 257,548
Claims priority, application Germany, May 28, 1971, 2126736
Int. Cl. F02m *39/00*; F02b *3/00*
U.S. Cl. 123—139 E **10 Claims**



1. A fuel injection pump-and-nozzle assembly forming part of a fuel injection apparatus serving an internal combustion engine, said assembly being of the type that has (a) a pump piston executing alternating delivery strokes and return or charging strokes, (b) a pump work chamber bounded by said pump piston, (c) a servo piston connected to said pump piston

to drive the latter, said servo piston having a diameter greater than that of said pump piston, (d) a pressure source externally of said assembly for delivering fuel under pressure to said assembly, (e) first supply conduit means extending from said pressure source to said pump work chamber, (f) a supply valve disposed in said first supply conduit means, (g) a servo pressure chamber bounded by said servo piston, (h) second supply conduit means extending from said pressure source to said servo pressure chamber, (i) discharge conduit means extending from said servo pressure chamber, (j) a housing including a bore, and (k) a valve plunger disposed within said bore for controlling said second supply conduit means and said discharge conduit means, said valve plunger being adapted to assume a first switching position for admitting pressurized fuel from said pressure source to said servo pressure chamber for effecting said delivery strokes and a second switching position for establishing communication between said servo pressure chamber and said discharge conduit means for effecting said return strokes, the improvement comprising,

A. a control pressure chamber formed within said bore and bounded by said valve plunger,

B. third supply conduit means extending from said pressure source to said control pressure chamber,

C. a solenoid valve disposed in and forming part of said third supply conduit means at a location immediately adjacent said valve plunger for intermittent energization in phase with the operation of the engine, so that pressurized fuel is admitted through said third supply conduit to said control chamber to move said valve plunger from one of its switching positions to the other, and

D. a throttle member for affecting the speed of said return strokes, said throttle member being disposed in said first supply conduit means between said supply valve and said pressure source, said throttle member including means defining a permanently set flow passage section so dimensioned as to substantially lengthen said charging period with respect to the injection period during which fuel is injected into the engine from said pump work chamber.

3,921,605

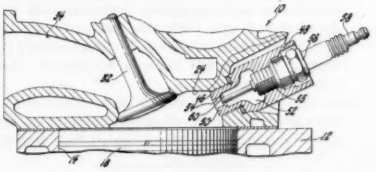
PLASMA JET IGNITION ENGINE AND METHOD

Floyd A. Wyczalek, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 439,352, Feb. 4, 1974, abandoned. This application Nov. 18, 1974, Ser. No. 525,028

Int. Cl.² F02P *23/00, 1/00;* **H01T** *13/20*

U.S. Cl. 123—143 B **4 Claims**



1. The combination in an internal combustion engine of

main combustion chamber defining means including a closed chamber and a member movable therein to vary the volume of said chamber, said movable member being connected with an output shaft for delivery of power thereto,

means for cyclically admitting to said combustion chamber combustible air-fuel mixtures having controlled air-fuel ratios substantially leaner than stoichiometric,

means for cyclically discharging burned gases from said combustion chamber, and

plasma jet ignition means including

a closed auxiliary chamber adjacent said main chamber and connected therewith by a restricted orifice at least when the main chamber is near its smallest volume,

spark ignition means mounted in a wall of said auxiliary chamber and having an electrode extending therein and forming a spark gap at a pont between the orifice and the center of the auxiliary chamber, said spark gap being in the flow path for highly turbulent gases being forced into or discharging from said auxiliary chamber through said restricted orifice, and

electrical ignition means connected with said spark ignition means and cyclically operable to cause an arc at said spark gap having a minimum energy level on the order of 50 millijoules and a minimum peak current on the order of 150 milliamps to ignite and propagate flame combustion within the turbulent lean air-fuel mixtures in and adjacent to the spark gap in said auxiliary chamber.

3,921,606

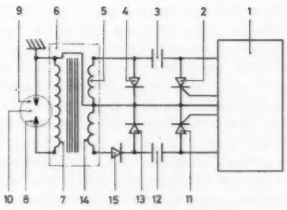
IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Roger Habert, Epinay-sur-Seine, France, assignor to Ducellier & Cie., Paris, France

Filed Nov. 27, 1972, Ser. No. 309,934

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 E **2 Claims**



1. An ignition system for an internal combustion engine comprising a voltage generator, a capacitor, a charging circuit for said capacitor connecting said voltage generator to said capacitor and including a diode through which said capacitor is charged in use, an ignition coil having first and second primary windings on which the second primary winding has a greater impedance than the first primary winding, and a secondary winding, a spark plug having its electrodes connected across the secondary winding, a thyristor connecting said capacitor to the first primary winding so that the secondary winding has induced therein a high voltage signal each time said thyristor is triggered, said high voltage signal being of short duration and having a rapid rise front and creating an electric spark between the electrodes of the spark plug, a timing circuit operating in synchronism with rotation of the internal combustion engine to trigger said thyristor, and an auxiliary circuit connected across said second primary winding and including a further capacitor, a charging circuit for said further capacitor and means controlling discharge of said further capacitor through the second primary winding for prolonging the arc created between the electrodes of said spark plug on triggering of the thyristor, and wherein said means for controlling the discharge of the capacitor through the second primary winding comprises a further thyristor connected for triggering by said timing circuit simultaneously with the triggering of the first mentioned thyristor.

3,921,607

LINER FOR AUXILIARY COMBUSTION CHAMBER

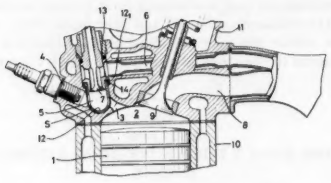
Nobuhiko Kawamoto, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 21, 1973, Ser. No. 372,271

Claims priority, application Japan, June 22, 1972, 47-73931[U]

Int. Cl. F02b *23/08*

U.S. Cl. 123—191 S 2 Claims



1. In an internal combustion engine, the combination of: walls including a movable piston forming a main combustion chamber, walls forming a cavity for an auxiliary combustion chamber, means forming a torch opening establishing communication between said chambers, said auxiliary chamber including a thin wall metallic cup of low heat capacity, said cup being cylindrical in shape and having an upper end open and a lower end closed by a hemispherical wall, said cylindrical and hemispherical portions of the cup being mounted within but spaced from the walls of said cavity, said cup having a first aperture offset laterally from the axis of the cylindrical cup and forming at least a part of said torch opening, a spark plug having electrodes positioned in said auxiliary chamber and outside said metallic cup, said cup having a second aperture on the opposite side of said cylindrical axis from the first aperture, said apertures each being large as compared to the thin wall of said cup, said second aperture establishing communication between said spark plug electrodes and the interior of the cup, said hemispherical end of the cup below both of said apertures serving as a fuel trap to collect any liquid fuel droplets.

3,921,608

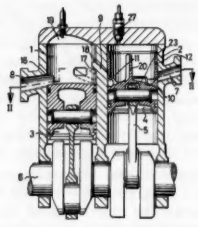
TWO-STROKE INTERNAL COMBUSTION ENGINE

Helmut Kottmann, 11 Gluckstrasse, 7067 Urbach, Germany

Filed Apr. 2, 1974, Ser. No. 457,166

Int. Cl.² F02B *1/08*

U.S. Cl. 123—69 R 8 Claims



1. In a two-stroke lifting cylinder combustion engine having an engine block; a charging pump cylinder and a working cylinder provided in the said block; a crankshaft; and a cylindrical slide pump piston and a working piston located in said pump cylinder and working cylinder, respectively, and connected to the crankshaft so as to be driven thereby; said block defining an overflow channel therein interconnecting said cylinders, and said pump piston having an aperture therein for controlling the flow of fuel and air through said channel; the improvement comprising a separating wall extending in a direction substantially parallel to the longitudinal axis of the cylindrical slide pump piston and located in the pump piston for subdividing a cavity defined therein into first and second chambers, said block defining channels therein for interconnecting each of the chambers with the working cylinder, wherein air in the first chamber is fed into the working cylinder via one of the channels in said block and a fuel and air mixture in said second chamber is fed into the working cylinder via another of the channels in the block.

3,921,609

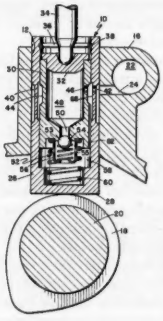
VARIABLE DURATION HYDRAULIC VALVE TAPPET

James E. Rhoads, La Mesa, Calif., assignor to Jack L. Rhoads, Taylor, Ariz.

Filed Aug. 16, 1974, Ser. No. 498,277

Int. Cl.² F01L *1/14*

U.S. Cl. 123—90.55 4 Claims



1. In a hydraulic valve lifter having a hollow cylindrical body with a closed lower end for engagement with a cam; a hollow cylindrical plunger axially slidable in said body and enclosing a pressure chamber in the lower end of the body; an external collecting channel on said body to receive oil from a pressurized source; a port opening into said body from said channel; a port in said plunger communicating with said first mentioned port to admit oil into the plunger; and a one-way valve in said plunger opening into said pressure chamber:

an improvement comprising:

at least one restricted oil bleed passageway providing, at all points of operation of the hydraulic valve lifter, continuous communication between said pressure chamber and said collecting channel; said oil bleed passageway being substantially dimensionally independent of temperature induced volumetric changes in said valve lifter;

the cross sectional area of at least a portion of said bleed passageway being insufficient to sustain oil bleed beyond a predetermined flow rate at high engine speed.

3,921,610

METHOD AND SYSTEM FOR PRODUCING A SIGNAL DETERMINING THE VALUE AND PHASE POSITION OF THE CLOSING ANGLE OF AN INTERNAL COMBUSTION ENGINE

Gunter Hartig, Hansastrasse 29, Karlsruhe 21, Germany (D-7500)

Filed Mar. 25, 1974, Ser. No. 454,736

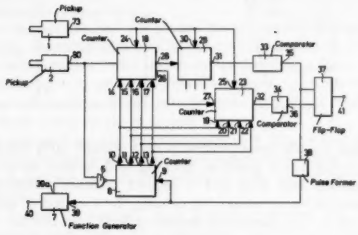
Claims priority, application Switzerland, July 23, 1973, 10739/73

Int. Cl.² F02P *1/00*

U.S. Cl. 123—117 R 39 Claims

1. A method of producing an operating pulse signal for determining the value and phase position of the closing angle of the ignition system of an internal combustion engine, said method comprising producing pulse sequences, the pulses of

which are synchronised with the rotary movement of the internal combustion engine, and determining an advance angle α corresponding to a predetermined time t by which the ignition spark of the internal combustion engine is to be advanced relatively to the top dead centre thereof by counting the pulses appearing during the time t at a particular speed of rotation of the internal combustion engine, subtracting them from pulses representing a larger angle ψ which extends between the top dead centre and an arbitrary phase position ψO, advanced relatively thereto before the counting of the said predetermined pulses begins from the position ψO, producing, during this counting, an ignition pulse when the differential



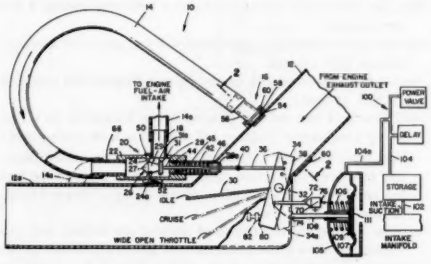
angle $\psi - \alpha$ is traversed, so that the ignition pulse is advanced by the angle α relatively to the top top dead centre, and representing a trigger angle δ which changes in the same manner as the angle α in dependence on the speed of engine rotation and is equal to the sum of the angle α and the closing angle ϕ by a number of pulses dependent on the speed of rotation U, subtracting said trigger angle δ as represented from the angle ψ before the counting of the predetermined pulses from the position ψO begins, to produce an operating pulse during this counting after the differential angle $\psi - \delta$ is traversed, so that the operating pulse occurs advanced by the closing angle ϕ relatively to the advance angle α.

3,921,611

EXHAUST GAS RECIRCULATION CONTROL BY EXHAUST FLOW

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Filed Feb. 1, 1974, Ser. No. 438,545
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **30 Claims**



1. An exhaust gas recirculation system for an internal combustion engine of a kind having an exhaust outlet, a fuel-air intake and an exhaust gas recycle conduit for recycling a part of the exhaust gases from the exhaust outlet back to the fuel-air intake, said system comprising,

valve means in the recycle conduit for regulating the amount of flow of said recycled exhaust gases through the recycle conduit, and

control means responsive to the exhaust gas flow in said exhaust outlet for positioning said valve means

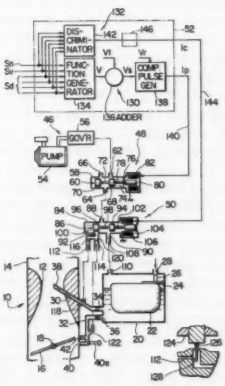
, said control means including a valve in the exhaust outlet mounted for movement in response to changes in exhaust gas flow and operatively connected to said valve means in the recycle conduit for controlling the exhaust gas recirculation through many changes in engine operating conditions.

3,921,612

APPARATUS FOR AND METHOD OF CONTROLLING AIR-FUEL MIXTURE IN A CARBURETOR OF AN AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Shigeo Aono, Seki, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Sept. 13, 1974, Ser. No. 505,540
Claims priority, application Japan, Sept. 19, 1973, 48-105701
Int. Cl.² F02B *32/00*; F24F *3/14*; F02D *11/08*
U.S. Cl. 123—119 R **38 Claims**

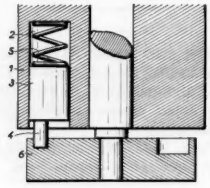


1. An apparatus for controlling the richness of an air-fuel mixture produced by a carburetor of an internal combustion engine of an automotive vehicle, comprising first passage means having an outlet end open into a substantially closed space behind the fuel in a fuel discharge circuit of the carburetor; second passage means having an outlet end open into said fuel discharge circuit; a source of pressurized air; air-flow regulator valve means in communication with the source of pressurized air and operative to regulate the flow rate of pressurized air through the valve means when actuated; air-flow shift valve means having a first operative condition providing communication between said air-flow regulator valve means and said first passage means and a second operative condition providing communication between said air-flow regulator valve means and said second passage means; and an electric control unit responsive to predetermined operating conditions of the vehicle and operative to supply a first control signal to said air-flow regulator valve means for varying the flow rate of pressurized air through the regulator valve means in accordance with said operating conditions of the vehicle and a second control signal to said air-flow shift valve means for holding the air-flow shift valve in said first operative condition when the vehicle operating conditions are representative of an excessively lean condition of the air-fuel mixture being produced in the carburetor or in said second operative condition when the vehicle operating conditions are representative of an excessively rich condition of the air-fuel mixture.

3,921,613
CONTROL APPARATUS FOR THE STARTER MOTOR FOR AN AUTOMOBILE ENGINE

André Thirion, 16, rue d'Arsonval, Dijon, Cote d'Or, France

Filed July 31, 1974, Ser. No. 493,727
Int. Cl.² F02N 17/00
U.S. Cl. 123—179 BG 3 Claims



1. Apparatus for starting the engine of an automotive vehicle and only permitting the reengagement of the starter after interrupting the ignition and/or the feed of an injection pump associated with a switch provided with at least three successive positions inclusive of stop, ignition on, and start positions, the apparatus opposing a second movement to the start positions, without first going towards the stop position, said apparatus comprising a turnable plate having an axis of rotation for controlling the operation of the starter circuit of an automotive vehicle, said turnable plate having a circumferential groove therein extending substantially concentrically with respect to said axis, a stator facing said plate and having a blind bore therein, a guide member supported in said bore for free slidable and rotatable movement therein, an eccentric pin secured to said guide member and extending therefrom into said groove, said groove having a widened terminal zone with three levels thereat, said groove being at the highest level outside said terminal zone, said pin being engaged in the groove at the highest level in the stop position which is remote from said terminal zone, said pin traveling at said highest level from one end of the groove to the other as the plate is rotated and passing successively from the stop position, to the ignition on position and then to the start position, said plate then returning in opposite direction to an intermediate angular running position in which the ignition remains on and said pin descends to the lowest level, said groove having a shoulder between the lowest and middle levels to engage said pin and prevent return rotation of the plate directly from the running position to the start position, said plate being turnable further in said opposite direction from said running position towards said stop position whereupon the ignition is cut and said pin rides onto the highest level of the groove so that the plate can now be returned to the start position.

3,921,614
COMPRESSED GAS OPERATED GUN HAVING VARIABLE UPPER AND LOWER PRESSURE LIMITS OF OPERATION

John E. Fogelgren, Annapolis, Md., assignor to Haybro Co., Moorestown, N.J.

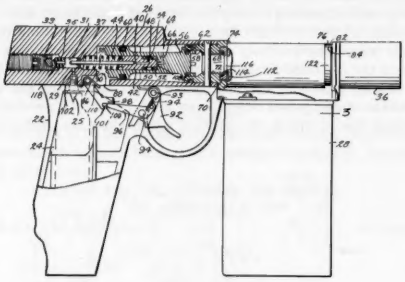
Filed Mar. 24, 1969, Ser. No. 809,920
Int. Cl.² F41B 11/06; F42B 5/02, 11/18, 11/22
U.S. Cl. 124—30 R 9 Claims

1. A device for launching a projectile portion of a projectile assembly, comprising:

means for holding said projectile assembly;

first valve means having a first chamber and operable by fluid pressure acting on different areas of said first valve means to release compressed fluid to arm said device;

second valve means having a second chamber and in selective operative relationship with said first valve means, said second valve means being biased by fluid pressure of said released compressed fluid in said second chamber acting on differential areas of said second valve means toward a position to pass the compressed fluid into said holding means to force at least a portion of said projectile assembly from said device; and

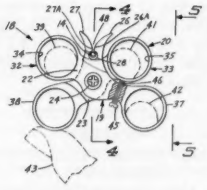


trigger means associated with said second valve means and having a first position latching said second valve means against said bias and a second position releasing said second valve means for causing the ejection of said portion of said projectile assembly from said device.

3,921,615
BOW STRING RELEASE DEVICES

Paul A. Dodge, Rte. 3, Menomonie, Wis. 54751

Continuation-in-part of Ser. No. 408,756, Oct. 23, 1973, abandoned. This application July 10, 1974, Ser. No. 487,290
Int. Cl.² F41B 5/00
U.S. Cl. 124—35 A 26 Claims



1. A bow string release device usable in conjunction with an arrow and a bow string mounted on a bow to effect release of the bow string to discharge the arrow along an intended forward longitudinal axis of travel, said device comprising:

first jaw means for engagement by a user and having a first arm means;

second jaw means for engagement by a user and having a second arm means;

said first and second jaw means being substantially coplanar in their entirety;

said first and second jaw means being locatable in a bow string tensioning position relative to a bow string and a bow which define a generally vertical bow string plane, and relative to an arrow mounted with respect to the bow for intended discharge of an arrow along a forward longitudinal axis of travel;

means connecting the first and second jaw means and permitting relative movement thereof generally about an axis perpendicular to the plane of the first and second jaw means and in said plane formed by a bow and bow string;

said first arm means providing first finger engageable means positioned thereon to accept one of a pair of generally downwardly directed user's fingers disposed generally parallel to a strung bow string normally intersecting the plane of said jaw means and receiving digital pressure when said jaw means are in bow string tensioning position;

said second arm means providing second finger engageable means positioned thereon to accept the other of said pair of user's fingers when said jaw means are in bow string tensioning position;

said first and second arm means being laterally aligned with each other, with said first and second finger engageable means located on opposite sides of said plane formed by a bow and a bow string when the jaw means are located in bow string tensioning position

first lip means diagonally extended from said first arm means for engaging a bow string during a bow string tensioning operation;

second lip means diagonally extended from said second arm means coacting with the first lip means to hold a bow string therebetween;

said first and second lip means having facing notches and being movable with said jaw means toward each other to a first position with said notches forming a bow string retaining eye, and movable away from each other to a second position to provide an open throat for release of a bow string retained in said eye;

said first and second finger engageable means being positioned between a bow and the means connecting the first and second jaw means when in bow string tensioning position;

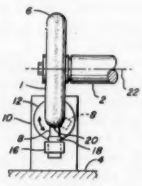
said means connecting said first and second jaw means causing said first and second jaw means to be matingly engaged to permit engagement of a bow string by the notches of said lip means with said finger engageable means each positioned to receive one of a pair of user's fingers disposed generally parallel to said axis of movement of said first and second jaw means and exerting rearward digital pressure operative to tension the bow string preparatory to release of an arrow.

3,921,616

PROCESS FOR TRUING A DIAMOND WHEEL UTILIZING A MOLYBDENUM TOOL

Istvan T. Kish, 16601 Excelsior Blvd., Minnetonka, Minn. 55343

Filed Mar. 18, 1974, Ser. No. 452,438
Int. Cl.² B24B *53/06, 53/02*
U.S. Cl. 125—11 CD **12 Claims**



1. A process for truing a resin bonded, diamond grinding wheel comprising:

rotating a resin bonded, diamond grinding wheel about a rotational axis extending substantially normal to the plane of the wheel; and

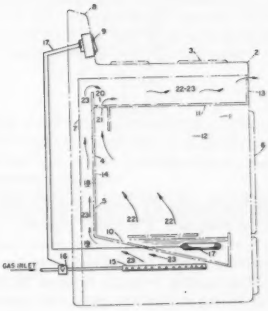
simultaneously holding a molybdenum tool in frictional contact with the peripheral work surface of said grinding wheel while it rotates.

3,921,617

KITCHEN APPLIANCE FOR COOKING FOOD

Hugh M. Rumbaugh, 1370 Revere Road, Akron, Ohio 44313

Continuation of Ser. No. 175,363, Aug. 26, 1971, abandoned, which is a continuation of Ser. No. 784,958, Dec. 18, 1968, abandoned. This application June 8, 1973, Ser. No. 368,679
Int. Cl. F24c *15/32*
U.S. Cl. 126—21 R **4 Claims**



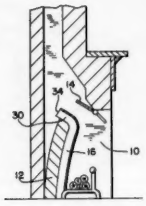
1. In a kitchen appliance for cooking food the combination comprising a box like frame having walls, an oven liner defining a cooking cavity having a vent gap opening communicating from the interior of said cooking cavity, means of a passageway for heated air between a wall of said liner and a wall of said frame, means of a gas burner having a gas valve for connection to a source of gas, said gas burner being adapted to supply a first aeolotropic stream of heat to flow in said cooking cavity, means to supply a second aeolotropic stream of heated air from said gas burner to flow within said passageway, the improvement comprising:

venturi means adapted to said passageway arranged to direct said flow of heated air flowing within said passageway to flow from said passageway into said venturi means, so that venturi means increases the speed of flow of the said second aeolotropic stream of flow to exceed its prior flow of speed within said passageway before it entered said venturi means, said increased flow then exits from said venturi means as a jet increased speed of flow of said prior second aeolotropic stream of heated air flow supplied by said gas burner, means to direct heated air from said venturi means exiting as said increased jet flow of heated air to flow over from one side to the opposite side, and to cover the entire exterior opening area of said vent gap opening communicating from the interior of said cooking cavity, so that the said second aeolotropic jet flow of heated air while flowing over, from one side to the opposite side and covering the entire said exterior opening area of said vent gap opening, maintains a jet vacuum over and covering the entire exterior opening area of said vent gap opening, so that said maintained jet vacuum dominates and controls all movement of heat of said first aeolotropic stream of heat within said vent gap opening, and vacuums all of said first aeolotropic stream of heat within said vent gap opening communicating from the interior of said cooking cavity through said vent gap opening to the exterior of said vent gap opening.

3,921,618
DEVICE FOR PREVENTING FIREPLACES FROM SMOKING

Wilfred Quiry, Worcester, Mass.

Filed Feb. 11, 1974, Ser. No. 441,364
Int. Cl. F24t 1/18
U.S. Cl. 126—120 3 Claims

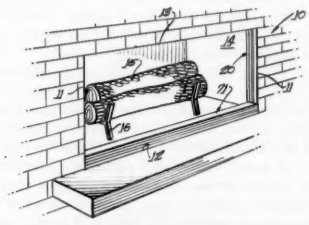


1. In a fireplace having a firewall inclined upwardly toward the front of the fireplace, a separate pipe-like air conductor mounted on said firewall at the front thereof, said air conductor being generally upright and following the inclined contour of the firewall, extending from the floor of the fireplace, said air conductor having a terminal upper end portion extending completely through the firewall into the flue at the rear of the firewall, said terminal upper end portion being bent rearwardly and passing through the firewall.

3,921,619
FIREPLACE SAFETY AND DECORATIVE CLOSURE DEVICE

Glenn Barriball, 35 E. Cottage St., Chagrin Falls, Ohio 44022

Filed Nov. 4, 1974, Ser. No. 520,494
Int. Cl.[2] F24C 15/10
U.S. Cl. 126—140 5 Claims



1. A fireplace safety and decorative closure device intended for use with an opening of a fireplace in the home and the like, the fireplace opening having a horizontal top surface, a horizontal floor surface, and opposed vertical side wall surfaces defining the fireplace opening, the device comprising, in combination:

a pair of identical vertically extending side tracks each adjustable in length and adapted to be mounted to opposite side wall surfaces of said fireplace opening and extend longitudinally therealong;

a plurality of elongated rectangularly shaped flat slat members each of a length to completely extend between said side tracks;

means hingedly connecting said slats together in an accordion-like fashion;

guide means affixed to opposite ends of each of said slat members and projecting outwardly therefrom adapted to engage said side tracks for guiding vertical movement of said slats therealong between an open position wherein said slats lie in stacked relationship on said fireplace horizontal floor surface, and a closed position wherein said slats are disposed vertically to completely cover the fireplace opening with the slats extending completely between said top surface and said bottom surface of said opening;

means for selectively retaining said slats in said closed position;

each of said side tracks comprises a first member and a second member;

a first member of an elongated hollow open ended tubular like configuration having a rectangular cross-sectional configuration, said first member comprising:

a flat back surface;

a flat front surface;

opposed parallel flat side wall surfaces;

a top end and a bottom end;

a passageway of a rectangular cross-sectional configuration extending completely between said surfaces between said top and bottom end thereof;

a slot extending longitudinally through said front surface completely between said top and bottom ends and opening into said passageway;

a plurality of longitudinally spaced apart laterally extending recess forming slots each disposed in said front surface and opening into a side edge of said slot;

a second member of an elongated hollow tubular-like configuration of a rectangular cross-sectional shape adapted to be telescopically received in said first member passageway for movement inward and outwardly thereof, said second member comprising:

a flat back wall surface;

a flat front wall surface;

a pair of opposed parallel flat side wall surfaces;

a top end and a bottom end;

a passageway of a rectangular cross-sectional configuration extending longitudinally between said surfaces and between said top and said bottom ends;

said front, back and side wall surfaces of said second member received in juxtaposition with the interior of said front, back and side wall surfaces respectively of said first member when said second member is telescopically inserted into the passageway of said first member;

a slot extending longitudinally through said front surface of said second member between said opposite ends thereof and having a width greater than the width of said first member slot so as to completely overlap said first member slot;

a plurality of longitudinally spaced apart U-shaped flange members each formed integrally with one edge of said second member slot and projecting inwardly of said slot co-planar with said front surface, the recess slot forming portion of each of said flange members being of the same width as said recess defining slot of said first member and adapted to overlie the same when in registration therewith;

a pair of axially aligned threaded apertures disposed in opposed side walls of said first member adjacent said top end thereof and communicating with said first member passageway;

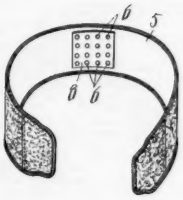
a pair of adjustment screws each having elongated threaded shanks of a diameter to be threadedly received in associated ones of said threaded apertures for movement inwardly and outwardly of said first member passageway; and

whereby said adjustment screws are adapted to engage at their innermost ends frictionally against associated side walls of said second member for frictionally retaining a selected telescopic position of said second member relative to said first member.

3,921,620
MAGNETIC MEDICAL TREATMENT DEVICE

Takeo Nakayama, 11-19, 5-chome Minamisenju, Arakawa, Tokyo, Japan

Filed Jan. 12, 1973, Ser. No. 323,045
Int. Cl.[2] A61N *1/42*
U.S. Cl. 128—1.3 **2 Claims**



1. A magnetic medical treatment device for a human wherein magnetic force is utilized to achieve a desired magnetic flux which is cause to act upon a human body generating polarization and induced currents within said human body, and comprising:

a supportive apparatus for magnetic means adapted to contact a portion of the human body;

a plurality of magnetic means arranged in a plurality of rows upon a first surface of said supportive device, each of the means being disposed with respect to each other such that one pole of each magnetic means closely contacts a selected part of the human body to achieve a desired intensity of magnetic flux; and

at least one ferromagnetic metal plate affixed to a second surface of said supportive device which is opposite said first surface of said supportive device;

wherein said supportive device comprises a belly-band having a main body and said magnetic means secured to said first surface of said supportive device where said belly-band contacts the waist portion of said human body.

3,921,621
METHOD AND SYSTEM UTILIZING A DISPOSABLE TRANSMITTER FOR MONITORING A PATIENT'S CONDITION

Lee R. Baessler, 706 Anderson St., Manhattan Beach, Calif. 90266

Filed Aug. 23, 1973, Ser. No. 390,759
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 H **9 Claims**

1. A system for monitoring the body temperature of a plurality of patients comprising:

a plurality of solid state electromagnetic wave energy transmitters each adapted to be carried by the body of a patient whose body temperature is to be monitored;

means for modulating the duty cycle of the electromagnetic wave energy transmitted to each of the solid state transmitters as a function of the body temperature of the patient by which the transmitter is carried;

a plurality of antennae each located in physical proximity to one of the patients to receive the modulated electromagnetic wave energy transmitted from the one of said plurality of transmitters carried by that patient, each of said antennae being connected to a plug; and,

a portable monitor having means selectively connected to the plug of one of said plurality of receiving antennae to monitor the duty cycle of the received electromagnetic wave energy to thereby monitor the body temperature of a selected one of the patient, said monitor means including:

means for detecting the duration of a cycle;

means for detecting the duty cycle of the detected cycle;

phase locked loop means for providing a digital signal variable in pulse repetition rate in response to said cycle duration detecting means to provide a predetermined number of pulses within the duration of the detected cycle; and,

means responsive to said duty cycle means and to said digital signal for manifesting the value of the sensed condition, said means including:

a bi-directional counter for counting in one direction responsively to the pulses occurring in said digital signal during the duty portion of a cycle of the received signal and for counting in the other direction during the remainder of the same cycle;

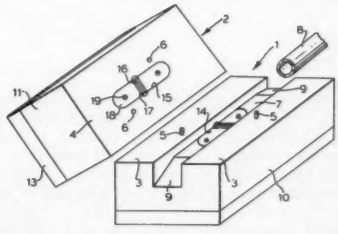
storage means; and,

a control pulse generator for effecting the transfer of the count in said bi-directional counter to said storage means and for effecting the resetting of said bi-directional counter at the end of each cycle.

3,921,622
METHOD AND APPARATUS FOR ULTRASONIC DETECTION OF INCLUSIONS IN A FLOWING FLUID

Edward Michael Cole, Chota Farm Bungalow, Sheldons Lane, Hook, Hampshire, England

Filed Feb. 26, 1974, Ser. No. 445,870
Claims priority, application United Kingdom, Feb. 27, 1973, 9482/73
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 V **12 Claims**



1. Apparatus for detecting inclusions in a fluid flowing within a flexible tube of substantially circular cross-section and not forming part of said apparatus, said inclusions being of different acoustic impedance from said fluid, said apparatus comprising:

an ultrasonic detector head having defined therein an aperture of substantially rectangular cross-section, said aperture being dimensioned to receive said tube and to deform said tube to adopt a substantially rectangular cross-section;

a pair of flexible elongate supports mounted to respective ones of a pair of opposite surfaces of said aperture, said supports being mounted parallel to and opposite one another and each extending substantially entirely across said surface to which it is mounted, and each support being above said surface to which it is mounted, whereby, when said tube is received in and deformed by said aperture, each of said supports is urged against substantially the whole of a respective one of a pair of opposite sides of said substantially rectangular cross-section of said tube;

an ultrasonic transmitter mounted to said ultrasonic detector head and operatively coupled to one of said supports to transmit an ultrasonic signal, via said one support and the wall of the tube, into and across said fluid flowing within the tube, said signal being transmitted through the flow in the form of a planar beam substantially transverse to the direction of flow and traversing substantially the whole of the cross-section of the flow;

means for energizing said transmitter to cause it to continuously transmit said signal;

an ultrasonic receiver mounted in said ultrasonic detector head and operatively coupled to the other of said supports to receive said signal; and

means coupled to said receiver to detect a change in amplitude of the signal received by the receiver caused by an inclusion passing through said planar beam.

3,921,623

HEART BEATING EXAMINING APPARATUS

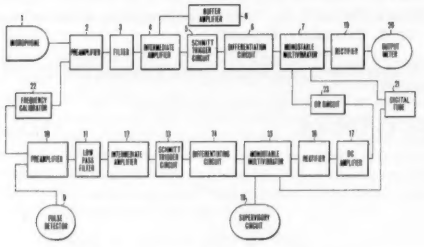
Hiroshi Okada; Hiroshi Horibe; Yasushi Mizuno; Shoji Yasui; Kazuo Ikegaya, and Nobuo Suzumura, all of Nagoya, Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1973, Ser. No. 321,018

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 P **9 Claims**



1. Apparatus for examining the beating of the heart comprising a combination of a heart beating measuring circuit, a heart pulse measuring circuit and a circuit for interconnecting said beating measuring circuit and said pulse measuring circuit, said heart beating measuring circuit including means for detecting the beating of the heart of a patient for producing signals of a plurality of frequencies, a filter coupled to receive said signals for selectively passing a signal of a predetermined frequency among said signals, means for deriving out the portions of the output from said filter which have a value exceeding a predetermined level, and means responsive to each of said portions for producing an electric pulse having a definite width; said heart pulse measuring circuit including means for producing a heart pulse signal, and means responsive to said heart pulse signal for producing a DC signal proportional to the period of heart pulses, and said interconnecting circuit including means responsive to said DC signal for controlling the width of said electric pulse produced by said beating measuring circuit inversely related to said period.

3,921,624

APPARATUS FOR RECORDING HEART RATE RHYTHM

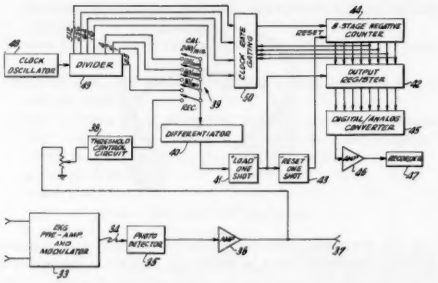
Joseph H. Vogelman, Roslyn, N.Y., assignor to Orentreich Medical Group, New York, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,399

Int. Cl.[2] A61B *5/04*

U.S. Cl. 128—2.06 F **5 Claims**

1. A cardiac monitoring unit comprising means for detecting the R-waves of the cardiac wave pattern of a patient, means operatively coupled to said detecting means for developing a binary signal having a binary value that is substantially proportional to the instantaneous rate of each pair of successive ones of said detected R-waves, said binary signal developing means comprising a source of a plurality of clock signals including a basic clock signal and integral binary fractions of said basic clock signal, multiple-stage counting means, means for setting a predetermined binary count in said counting means upon the detection of an R-wave, and logic means operatively interposed between said clock signals source and said counting means and receiving said plurality of clock signals and binary signals from selected stages of said counting means, said logic means being effective to selectively apply said clock signals at sequentially lower rates to said counting means in response to the binary signals in said selected stages of said counting means during the period between succeeding



R-waves, thereby to modify the signal count in said counting means, and means operatively coupled to said binary signal developing means for producing a visual record corresponding to the binary count in said counting means upon the detection of the succeeding R-wave, said record thereby indicating the respective rates of each succeeding pair of R-waves, whereby the occurrence of an abnormal deviation from a regular heart rhythm can be readily perceived on said record.

3,921,625

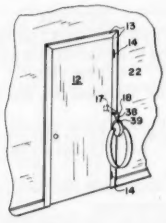
VIBRATORY MASSAGER

Jack V. Feather, 11293 Kerrigan Drive, Oakland, Calif. 94604

Filed Feb. 9, 1973, Ser. No. 331,086

Int. Cl.[2] A61H *7/00*

U.S. Cl. 128—63 **6 Claims**



1. A vibratory belt massager for use in connection with a door structure comprising

a rigid mounting bracket having a first end portion arranged to be engaged between the door panel and door jamb of said door structure and a flange at said first end portion arranged to contact the reverse door side, and having a second end portion arranged for attachment of a suspensory link,

a vibratory motor assembly including an electrical motor having axially extending axle shafts and encased within a housing including structure for attachment of suspensory link,

a suspensory link member joining the second end of said bracket to said motor housing,

pulleys carrying eccentrically disposed crank pins secured to said motor axle shafts,

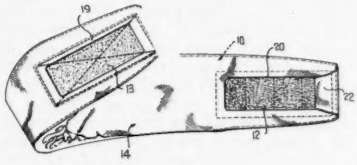
massage belt attachment means rotatably mounted on the crank pins of said pulleys, and

a massage belt attachable to said massage belt means.

3,921,626
CERVICAL COLLAR HAVING REMOVABLE COLOR COORDINATED COVER

Phoebe B. Neel, 829 N. Dawson St., Thomasville, Ga. 31792

Filed Nov. 19, 1974, Ser. No. 525,088
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—75 6 Claims

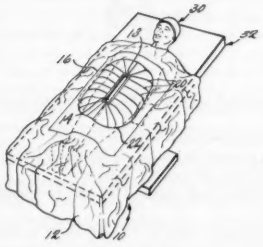


1. A removable cover element for a cervical collar or the like comprising a unitary flexible fabric sleeve having a desired color, said sleeve open at one end and closed at its opposite end, said sleeve having a side wall window opening near its closed end being approximately rectangular and somewhat elongated longitudinally of the sleeve, and said sleeve being slotted in its opposite side wall portion at its open end, said slot being approximately rectangular and extending through the open end of the sleeve.

3,921,627
SURGICAL DRAPE WITH DRAINAGE TROUGHS

Gerald M. Wilson, Howardsville, Va., and John G. Ferreri, Spartanburg, S.C., assignors to Spartan Mills, Inc., Spartensburg, S.C.

Filed May 14, 1974, Ser. No. 469,874
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—132 D 12 Claims

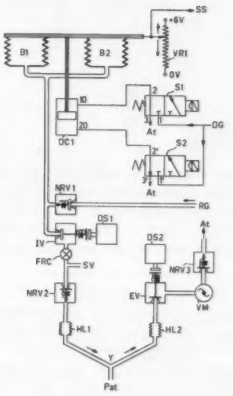


1. A surgical drape comprising:
a. a main sheet having a fenestration therein;
b. an absorbent area generally surrounding said fenestration; and
c. a plurality of troughs of material having less absorbency than said absorbent area extending generally radially from said fenestration in said absorbent area for providing drainage of fluid from said fenestration to said absorbent area to be more readily absorbed thereby.

3,921,628
MEDICAL VENTILATORS

George Edward Smythe, and Geoffrey Keith Orton, both of London, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 282,587, Aug. 21, 1972, abandoned.
This application Apr. 25, 1974, Ser. No. 464,511
Claims priority, application United Kingdom, Aug. 19, 1971, 38978/71
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—145.6 12 Claims



1. In a medical ventilator of the constant volume type including a variable volume reservoir for storing respiratory gas during each expiration period of a repetitive respiratory cycle and from which reservoir gas is passed to a patient during each inspiration period of the cycle, an electrical position-sensing element operable with the reservoir to give an indication of the instantaneous volume of the reservoir over the variable range of the latter, an adjustable electrical volume-control element settable to the required volume of gas to be passed to the patient, actuating means for expanding and contracting the reservoir so as to perform the storage and passage functions of the latter, and a comparator for comparing the said indication of the instantaneous volume with the setting of the control element, the comparator being arranged to give an output signal when equality of the comparison is achieved, the improvement comprising means for terminating operation of the actuating means to expand the reservoir during each expiration period when said output signal is given and further comprising an electronic multivibrator having two states and individual adjustment means for determining the dwell times of each of said two states, and having respective signal outputs, and means for operating the actuating means to initiate the expiratory and the inspiratory periods in response to said respective outputs.

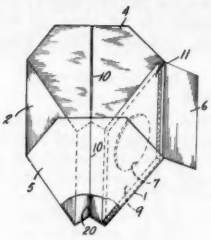
3,921,629
BANDAGE

Fred Vage Gunnar Ekbladh, Postlada 178, S-430 40 Saro, Sweden

Filed Feb. 5, 1974, Ser. No. 439,831
Claims priority, application Sweden, Feb. 5, 1973, 73015455
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—156 3 Claims

1. A bandage to be used on open wounds for receiving secretion and/or solid excrement, said bandage having a first sheet-like portion adapted to be adhesively secured against the body, and an opening therein so that said portion may be placed around the incision, said bandage having an outer

sheet-like portion secured at one edge to said first portion by a hinge, said outer portion being secured to said first portion also by two lateral connecting side members to form a pouch, said side members having at least one folding line which folds



inwardly to close the pouch, and a flap secured to said first portion at an edge opposite said one edge by a second hinge and adapted to close the bandage and to be secured against the exterior surface of said second portion, thereby forming a closed pouch which retains such secretion and/or excrement.

3,921,630

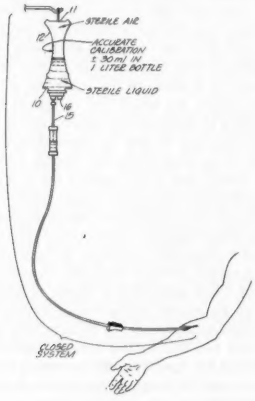
THERMOPLASTIC BOTTLE WITH CONTROLLED LATERAL COLLAPSE AND METHOD OF DISPENSING LIQUID THEREFROM

Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 26, 1974, Ser. No. 445,836

Int. Cl.[2] A61M 5/14

U.S. Cl. 128—214 R **24 Claims**



1. A "closed" system for administering medical liquid comprising the combination of a substantially transparent thermoplastic bottle with "controlled lateral collapse" for accurately measuring the volume of liquid dispensed without inletting air into the bottle, which bottle includes a rigid oval base adapted to support the bottle in a longitudinally upright position on a flat surface during storage; a rigid oval shoulder with a non-air-inletting dispensing outlet therethrough at an opposite end of the bottle; a laterally flexible generally oval side wall integrally connected to the base and shoulder and having a cross-section with a transverse major axis and transverse minor axis, said transverse major axis remaining generally constant in length at various locations along the bottle's length, and said transverse minor axis becoming progressively shorter as the minor axis proceeds from the oval shoulder to the oval base along the bottle's length; volumetric calibrations on the side wall; a sterile medical liquid initially filling the bottle between 50 and 95% of its internal capacity, and sterile air occupying the remaining portion of the internal capacity of the bottle immediately prior to dispensing from the bottle to provide a level upper surface of the liquid for measuring against the calibration; said bottle having opposed portions of the side wall that progressively deflect inwardly along its minor axis toward each other as liquid is drained by gravity from the outlet, which side wall portions are maintained at spaced relationships until the liquid's upper surface has descended below said side wall portions for accurate measurement of the liquid's upper surface against the calibrations; said rigid oval base having a centrally located recess therein; a hinged thermoplastic hanger integrally formed with the bottle and foldably retained within this recess during storage; a series of protruding feet on the rigid oval base for supporting the bottle on a flat surface during storage; said thermoplastic bottle having a medication additive port closed off by a puncturable resealable rubber diaphragm; a tubular adapter connected to the bottle and surrounding the dispensing outlet; a puncturable diaphragm closing off the tubular adapter; a tubular spike of an administration set wedgingly secured in the tubular adapter; a flexible conduit connected to the spike at one end and extending to a lower dispensing end of the conduit; and an enlarged drip chamber connected in series with the administration set.

3,921,631

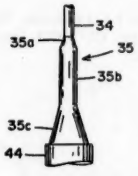
CATHETER INSERTION DEVICE AND METHOD OF CATHETER INTRODUCTION

Thomas C. Thompson, Dallas, Tex., assignor to Vicra Sterile, Inc., Dallas, Tex.

Division of Ser. No. 264,888, June 21, 1972, Pat. No. 3,827,434. This application Aug. 1, 1974, Ser. No. 493,987

Int. Cl.[2] A61M 5/00

U.S. Cl. 128—214.4 **9 Claims**



1. A through the needle catheter insertion device comprising:

a hollow slotted needle for puncturing;

a catheter of generally constant diameter lying in the needle and extending proximally thereof;

a rigid catheter hub secured to the proximal end of the catheter;

a pliable enlarged portion formed from a material having the pliability of silicone rubber secured around the catheter adjacent the distal end of the rigid catheter hub, the distal end of the pliable enlarged portion having a diameter substantially equal to the outer diameter of the catheter, said enlarged portion including an effective sealing segment having a diameter at least substantially equal to the outside needle diameter and having no diameter greater than about 50% larger than the outside needle diameter, said segment being at least about 0.21 inches long, whereby the catheter may be inserted into a blood vessel through a puncture formed by the needle through the skin and vessel and such sealing segment on the catheter may be engaged with the vessel and skin punctures to seal such punctures, preventing the escape of blood from the periphery of such punctures.

6. A through the needle catheter insertion device comprising:

a hollow slotted needle for puncturing;

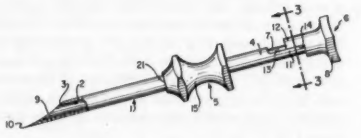
a catheter of generally constant diameter lying in the needle and extending proximally thereof;

a catheter hub secured to the proximal end of the catheter; an enlarged portion secured around the catheter, the distal end of the enlarged portion having a diameter substantially equal to the outer diameter of the catheter, said enlarged portion including an effective sealing segment having a diameter at least substantially equal to the outside needle diameter and having no diameter greater than about 50% larger than the outside needle diameter, said effective sealing segment being at least about 0.21 inches long and including a substantially cylindrical segment, whereby the catheter may be inserted into a blood vessel through a puncture formed by the needle through the skin and vessel and such sealing segment on the catheter may be engaged with the vessel and skin punctures to seal such punctures, preventing the escape of blood from the periphery of such punctures.

3,921,632
IMPLANT DEVICE

Frank M. Bardani, 16 Loewen Court, Rye, N.Y. 10580

Filed Aug. 16, 1974, Ser. No. 498,079
Int. Cl.² A61M *5/00, 31/00*
U.S. Cl. 128—217 **11 Claims**



1. An implant device comprising:

a. a tubular member having a central longitudinal axial bore therethrough, a pointed elongated annular concavely bevelled implanting end, and a charging end, each of said ends communicating with said bore;

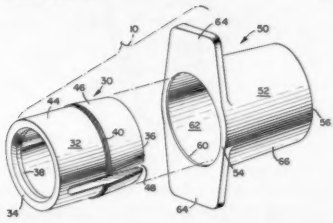
b. a plunger having a solid, pointed, elongated annular concavely bevelled end, said plunger being removeably inserted in said bore and slideably movable therein along the longitudinal axis of said tubular member from a first position to a second position at which maximum insertion of the plunger into the bore is obtained and the implanting end of the tubular member and the pointed end of the plunger are aligned to form a complimentary substantially continuous pointed elongated annular concavely bevelled penetration surface; and

c. means for aligning said implanting end and said pointed end, said means for aligning being only one semicircular projection on the charging end of the tubular member, said first projection extending for a distance in the axial direction whereby a pill receiving trough is formed for facilitating introduction of an implant dosage form into the bore of the tubular member, and a second semi-circular projection on the plunger, the first and second projections being complimentary and alignable at only the second position, alignment of the first and second projections serving to simultaneously align said implanting end and said pointed end, said first projection being an extension of the charging end and having a first shoulder and a second shoulder, said plunger having a head portion the diameter of which is larger than the diameter of bore of the tubular member, said second projection being an extension of the head portion of the plunger and having a third shoulder and a fourth shoulder, said plunger being movable within said bore from the first position to the second position only when the first and second shoulders are aligned opposed to and in sliding contact respectively with the third and fourth shoulders.

3,921,633
FINGER GRIP DEVICE

Edward A. Tischlinger, Niantic, Conn., assignor to Survival Technology, Inc., Bethesda, Md.

Filed May 6, 1974, Ser. No. 467,157
Int. Cl.² A61M *5/18*
U.S. Cl. 128—218 R **3 Claims**



1. A finger grip device for a syringe wherein the syringe includes a cylindrical cartridge having one end closed by a cannula assembly and the other end open, a plunger slidably carried within the cartridge and medicament located in the cartridge between the plunger and closed end of the cartridge said finger grip device fitting over and gripping the open end of the cartridge, the finger grip device comprising:

a collet, said collet having a cylindrical body open at both the rear and forward ends, the inner cylindrical surface being of uniform diameter, the outer surface of the body tapering outwardly and rearwardly from the forward end of the body, slot means in the collet body extending lengthwise and through the forward end thereof, a collet sleeve receiving the collet, said collet sleeve including a cylindrical sleeve body open at both its rear and forward ends, the inner surface of the sleeve body tapering outwardly and rearwardly from the forward end of said sleeve body to receive the tapered outer surface of the collet when said collet is inserted into the collet sleeve with its forward end facing the same direction as the forward end of the collet whereby relative movement of the collet with respect to the collet sleeve in the forward direction will cause the collet to be compressed and grip the open end of the cartridge over which it is passed, said collet sleeve being further provided with a pair of outwardly extending wing portions adapted to receive the fingers of the syringe user, and means for selectively positioning and holding said collet sleeve and said collet together in a retracted and assembled position to receive said cylindrical cartridge including retaining means on the rear end of the cylindrical body of the collet sleeve interengaging a biased outer mid-portion groove means on the collet.

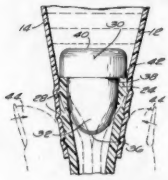
3,921,634
VALVE AND OUTLET TUBE COMBINATION FOR A PLASTIC BAG

Byron L. Mather, Milwaukee, and James G. Manschot, Mukwonago, both of Wis., assignors to Plastronics, Inc., Milwaukee, Wis.

Filed Aug. 19, 1974, Ser. No. 498,768
Int. Cl.² A61M *3/00*
U.S. Cl. 128—227 **2 Claims**

1. A valve and outlet tube combination comprising: a plastic bag having a flexible outlet neck portion formed in the lower portion of the bag and an outlet tube of flexible material extending into the outlet neck portion of the plastic bag and sealed thereto; and

a valve member positioned inside the plastic bag and adapted for cooperation with the outlet end of said outlet tube, said valve member comprising a head portion having a tubular body portion extending therefrom, said tubular body portion having a rounded tip and an outside diameter slightly greater than the inside diameter of said outlet tube, said head portion having a shoulder formed thereon which extends transversely of the axis of said tubular body portion, said shoulder adapted for abutting



contact with the end of the outlet tube when the tubular body portion of said valve member is inserted into sealing engagement with the end portion of the outlet tube said valve member adapted to be moved from its closed position inside the end of said outlet tube by applying a squeezing action through said outlet neck portion and the end of said flexible outlet tube against the rounded tip of said tubular body portion of said valve member causing said valve member to be forced out of said outlet tube to its open position.

3,921,635

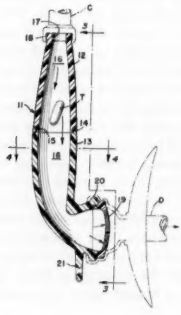
SHOWER HEAD AND DOUCHE

William Kohlmann Gauthier, 310 Codifer Blvd., Metairie, La. 70005

Filed May 22, 1974, Ser. No. 472,091

Int. Cl. A61m *3/00*

U.S. Cl. 128—229 **17 Claims**



1. A hand-held shower head comprising an elongate, hollow body defining a handle, a hose attaching means on one end of the body to attach said shower head to a source of water or the like, a spray head on the other end of the body to effect spraying of water or the like flowing through said body from said source, for use as a shower, said other end of the body having a radially outwardly extending douche attaching flange means thereon, a douche having a generally cup-shaped, flexible attaching means on one end thereof resiliently engaged over said flange releasably attaching said douche to said flange for receiving water from said spray head, and chamber means operatively associated with said shower head for containing a dissolvable cartridge or the like therein to obtain flow of treated water from the spray head and through the douche.

3,921,636

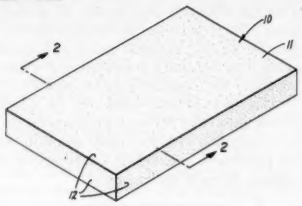
NOVEL DRUG DELIVERY DEVICE

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 323,370, Jan. 15, 1973, which is a continuation-in-part of Ser. No. 169,974, Aug. 9, 1971, abandoned. This application Apr. 22, 1974, Ser. No. 462,895. The portion of the term of this patent subsequent to Aug. 10, 1988, has been disclaimed.

Int. Cl.² A61F *13/20*; A61M *31/00*; A61F *5/46*

U.S. Cl. 128—260 **13 Claims**



1. A drug delivery device which releases drug continuously at a controlled rate over a prolonged period of time when administered to an animal comprising:

a. a plurality of reservoirs each comprising

i. a drug confined within

ii. a drug release rate controlling material permeable to the drug by diffusion, microporous flow or a combination thereof, said drug release rate controlling material being essentially insoluble in body fluids and essentially non-crushable under the conditions of administration and, with the proviso that if said drug is highly water soluble, substantially impermeable to body fluids; dispersed in .

b. a matrix formed of a material permeable to said drug at a rate greater than the rate of permeability of the drug through said drug release rate controlling material so that the rate of drug permeation through said drug release rate controlling material determines the rate of release of drug from the device;

whereby when the device is administered said reservoirs remain intact and release drug by diffusion, microporous flow or a combination thereof continuously at a controlled rate for said prolonged period.

3,921,637

INHALER FOR POWDERED MEDICAMENT

Annette Bennie, Benoni, South Africa, and Norman Leonard Reed, Waltham Cross, England, assignors to Bespak Industries Limited, England

Filed July 22, 1974, Ser. No. 490,469

Claims priority, application United Kingdom, July 23, 1973, 35003/73

Int. Cl. A61l *9/00*

U.S. Cl. 128—266 **8 Claims**

1. An inhaler for powdered medicaments comprising a housing,

a chamber in the housing;

a capsule containing a dose of the medicament to be dispensed, said capsule being located in the chamber;

a duct in the housing, one end of the duct being open to the atmosphere and the other end of the duct having its outlet in a mouthpiece for insertion into the mouth of a user;

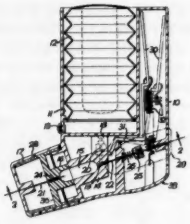
an outlet passage connecting the chamber to the duct;

manually operated pump means for supplying air under pressure to the chamber;

an inlet passage means connecting the pump means to the chamber to carry all of the air supplied by the pump means into the capsule;

valve means situated between the pump means and the chamber in the inlet passage for preventing air under pressure and medicament from entering the duct;

a flow sensor arranged in the duct; and



said valve means being operable to open in response to the flow sensor means to allow air under pressure and medicament to enter the duct when the flow sensor detects a user inhaling through the duct.

3,921,638

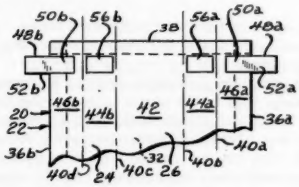
DIAPER WITH PLEAT SECURING TAPE MEANS

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,494

Int. Cl.² A61F *13/16*; A41B *13/02*

U.S. Cl. 128—287 **14 Claims**



1. A disposable diaper, comprising:

an absorbent pad assembly having a front surface, a back surface, a pair of side edges, a longitudinally extending central panel, and panel means overlying the front surface of the central panel adjacent its sides, said panel means including a pair of longitudinally extending outermost panels defining the side edges of the pad assembly; a pair of pressure-sensitive tape strips having a first portion fixedly secured to the back surface of said outermost panels adjacent the side edges of the pad assembly and a second securement portion extending from an end of the first portions adjacent the side edges of the pad assembly for use in securing the diaper about an infant during placement of the diaper; and

release sheet means positioned on the pad assembly at a location on another panel to cover adhesive on the securement portions of the strips, said securement portions of the strips being attached to the release sheet means to retain the outermost pleats in their overlying relationship prior to placement of the diaper.

3,921,639

DISPOSABLE DIAPER HAVING FASTENING TABS TUCKED IN FACING SHEET THEREOF

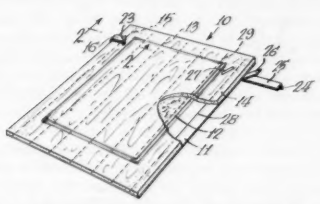
Talivaldis Cepuritis, Kenilworth, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 4, 1974, Ser. No. 520,754

Int. Cl.² A61F *13/16*

U.S. Cl. 128—287 **7 Claims**

1. A disposable diaper, having an inside surface for direction toward an infant when the diaper is worn by that infant and an outside surface for direction away from said infant, which comprises a moisture-impervious backing sheet; a moisture-retaining layer attached to said backing sheet and including a pad of absorbent material superposed on said backing sheet and a facing sheet overlying said pad, substantially coextensive with the backing sheet, and having a slot provided in the facing sheet near a longitudinal margin of said diaper; and an adhesive tab fastener having a fixed end secured to said



backing sheet on the outside surface of the diaper and at a marginal location thereof, and a free end provided with a tacky surface facing in the same direction as the inside surface of the diaper and releasably covered with a release-coated cover strip; said free end being removably received in said slot.

3,921,640

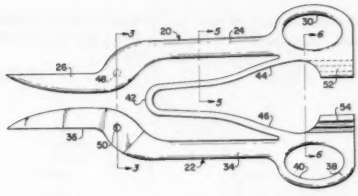
DISPOSABLE SURGICAL INSTRUMENTS

John O. Freeborn, New Fairfield, Conn., assignor to International Paper Company, New York, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,819

Int. Cl.² A61B *17/08*, *17/12*, *17/32*

U.S. Cl. 128—318 **14 Claims**



1. A surgical instrument formed of a single piece of molded, resilient material which provides a pair of spaced arms each including an elongated shank portion having a front end terminating in a jaw member and a rear end provided with a finger grip section, pivot means for connecting said arms together for relative pivotal movement, and an integral U-shaped spring element located between said shank portions and connected to said rear ends of said shank portions for holding said arms together in an unassembled configuration of the surgical instrument, said spring element normally biasing said finger grip sections apart in an assembled configuration of the surgical instrument to maintain said jaw members in a normally open position, said jaw members being movable together to a closed position upon application of manual pressure on said finger grip sections.

3,921,641

CONTROLLING FORCEPS

Jaroslav Fabian Hulka, Chapel Hill, N.C., assignor to Research Corporation, New York, N.Y.

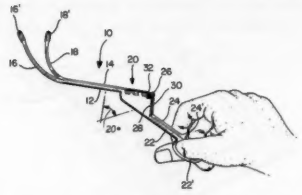
Filed Dec. 14, 1973, Ser. No. 424,753

Int. Cl.² A61B *17/42*

U.S. Cl. 128—321 **4 Claims**

1. Forceps comprising a pair of parallel side-by-side shank portions, end portions extending from one end of each of the shank portions and terminating in tip portions, said end portions gently curved to rise about 90° such that said tip portions a plane which intersects the longitudinal axes of said shank

portions and to flare outwardly from about 2 to 4 centimeters in respect to said plane, a handle portion extending from the other end of each of the shank portions and curved downwardly at an angle of about 20° in respect to said plane and in the opposite direction to the direction of curvature of said end portions and flared outwardly in respect to said plane when the end portions are together an amount at least as great as the



maximum divergence at the end portions and in abutting side-by-side relation when the end portions are divergent, a hinge connecting said handle portions with the pivotal axis of the hinge being parallel to and generally axially aligned with the longitudinal axes of the shank portions and lying along said plane which intersects the longitudinal axes of the shank portions, and a spring normally urging said handle portions into the closed abutting side-by-side position.

3,921,642

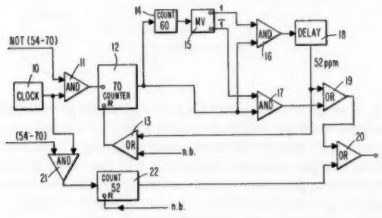
AUTOMATIC RATE ADJUSTMENT PACER WITH NATURAL RATE SEARCHING MEANS AND METHOD OF OPERATION

Thomas A. Preston, 820 37th Ave., Seattle, Wash. 98122, and Albert W. Preston, Jr., 111 Ogden Ave., Swarthmore, Pa. 19081

Continuation-in-part of Ser. No. 484,561, July 1, 1974, abandoned. This application Sept. 20, 1974, Ser. No. 507,903

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PG **31 Claims**



1. A demand pacer adapted to detect natural heartbeats, and to deliver stimulus signals in the absence of detected natural heartbeats, said demand pacer being operative in combination with means for delivering signals to and receiving signals from a patient's heart, said pacer comprising:

a. stimulus means for delivering signals, said stimulus signals normally being delivered at a rate at least as great as a predetermined normal rate;

b. means for detecting the occurrence of natural heartbeat signals;

c. said stimulus means including searching means for automatically searching for the occurrence of natural heartbeats at a rate within a predetermined range below said normal rate, said searching including decreasing said delivered stimulus signal rate while stimulus pulses are being delivered; and

d. means for inhibiting the delivery of signals from said stimulus means in response to the detection of natural heartbeats, said inhibiting means being continuously operative during said searching as well as during said normal delivery of stimulus signals, thereby permitting natural pacing within said predetermined range as well as above said normal rate in response to the occurrence of natural heartbeats.

3,921,643

COMB DEVICE FOR CLEANING GRAIN BEFORE IT PASSES INTO THE CLEANING-SHOE OF A COMBINE-HARVESTER

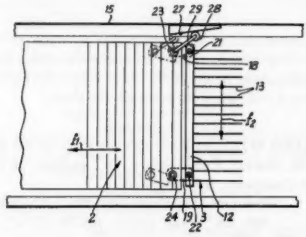
Michel Armand Laurent, Villeneuve d'Asq, and Daniel Claude Barbieux, Roubaix, both of France, assignors to International Harvester Company, Chicago, Ill.

Filed July 11, 1974, Ser. No. 487,488

Claims priority, application France, July 11, 1973, 73.25397

Int. Cl.² A01F *12/30*

U.S. Cl. 130—24 **8 Claims**



1. In a combine-harvester including a frame, a longitudinally reciprocating shaker table having a discharge edge, and a cleaning system,

a comb device for processing grain as it passes from said discharge edge of the shaker table into the cleaning system, said comb device comprising an elongated comb body and a series of fingers protruding therefrom, said comb body coupled to said longitudinally reciprocating shaker table along said discharge edge by supporting and guiding means which cause said comb device to reciprocate longitudinally along with said shaker table and permit it to move in a transverse direction thereto.

control means attached to said means and operatively associated with said comb body for imparting transverse movement thereto in response to longitudinal reciprocation of said shaker table.

3,921,644

APPARATUS FOR DETERMINING THE FIRMNESS OF FILLERS IN CIGARETTE RODS OR THE LIKE

Joachim von der Lohe; Heinz Gretz, both of Hamburg, and Uwe Heitmann, Luneburg, all of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Division of Ser. No. 764,482, Oct. 2, 1968, Pat. No. 3,595,067. This application Mar. 5, 1971, Ser. No. 121,404

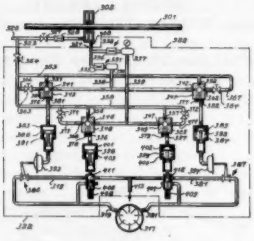
Claims priority, application Germany, Oct. 9, 1967, 1632208

Int. Cl.² A24C *5/34*

U.S. Cl. 131—21 B **1 Claim**

1. In a machine for the production of articles containing comminuted tobacco, a combination comprising converting means for converting a stream of comminuted tobacco particles into a rod-like filler, including an equalizing device having removing means for removing tobacco particles from the stream; deforming means for directing a gas against successive increments of and for thereby subjecting the filler to deformation whose extent is inversely proportional to the firmness of the filler; measuring means for determining the extent of deformation of the filler and for producing signals indicating such deformation; and regulating means for regulating the

quantity of comminuted tobacco in the filler as a function of said signals, said regulating means being arranged to change the position of said removing means with reference to the stream and including a rotary pneumatic motor and a pair of conduit means for supplying compressed gas to said motor whereby the motor causes said removing means to remove less tobacco in response to admission of gas by way of one of said conduit means and to remove more tobacco in response to



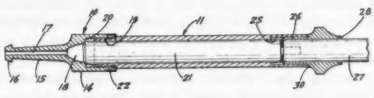
admission of gas by way of the other conduit means, said measuring means comprising means for producing signals indicating positive and negative deviations from an optimum firmness of the filler, first control means provided in one of said conduit means to admit gas to said motor in response to signals indicating said positive deviations and second control means provided in the other conduit means for admitting to said motor gas in response to signals indicating said negative deviations.

3,921,645

SAFETY CIGARETTE HOLDER

Harry C. Hagman, 6122 Portland Ave., Minneapolis, Minn. 55417

Filed Sept. 11, 1974, Ser. No. 505,158
Int. Cl.² A24F *13/10*
U.S. Cl. 131—182 **3 Claims**



1. A safety filtering cigarette holder consisting essentially of:

A. a mouthpiece composed of heat-insulating material and having a longitudinal passage therethrough, one end of said passage being of enlarged diameter and internally threaded,

B. a separable elongated tubular filter cylindrical housing threadably engaged at one end in said mouthpiece in alignment therewith about a common longitudinal axis, said filter housing being adapted to contain a cigarette with a loose slide fit as a filter element, said housing being relatively thin walled, internally beveled at the end adjacent to the mouthpiece to facilitate insertion of cigarette filters therein, of a length substantially equal to the combined length of a cigarette and the shank of the grip member, composed of metal having good heat conducting properties selected from the group consisting of aluminum, copper and silver and alloys thereof, and having a recess at the end opposite from the mouthpiece,

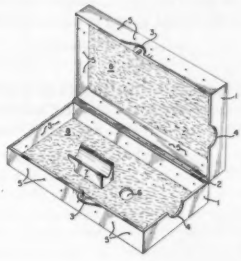
C. a hollow separable cylindrical cigarette grip member telescopically and frictionally engaged in said recess in said filter housing in longitudinal alignment therewith, said grip member having a shank and a head, the walls of the shank of said grip member received in said recess having a pair of diametrically opposed longitudinally extending cigarette disengaging open-ended slots of constant width, the narrow longitudinal passage extending in a radial direction through said slots being closed by the filter housing wall when said grip member is in telescopic engagement with said filter housing, said slots being adapted when disengaged from said recess to receive a portion of the wall of the end of the filter housing therein to disengage a cigarette held therein, the head of the grip member having an internally beveled cigarette receiving mouth, the outer periphery of said head in transverse cross-section being of a flat-sided regular polygonal configuration having from five to seven flat sides of substantially uniform length, and the minimum distance between the center of one of the flat sides of the periphery of the head of the cigarette grip member and the longitudinal axis of the holder is at least about 1/16 inch greater than the maximum radius of the mouthpiece, said grip member being composed of metal having good heat conducting properties selected from the group consisting of aluminum, copper and silver and alloys thereof.

3,921,646

TOBACCO SMOKE INHIBITOR

Jeanette M. Kosta, P.O. Box 5380, Darwin, N.T., Australia (5794)

Filed Apr. 2, 1973, Ser. No. 346,847
Int. Cl.² A24F *19/10*
U.S. Cl. 131—238 **1 Claim**

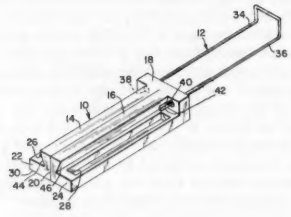


1. An ash receiver adapted to inhibit tobacco smoke which may accumulate therein, comprising an open-topped receptacle having a planar lower base member adapted to be horizontally supported on a flat surface, said base member having vent means extending vertically therethrough, a liner covering the upper face of said member and adapted to remove undesirable material from tobacco smoke which may contact the same, and a tobacco product support located adjacent to said vent means and adapted to support a lit tobacco product horizontally thereon such that the lit end thereof is positioned above said liner and in close proximity to said vent means, and to said liner, vertically arranged first wall means surrounding said base member and having a notched portion, fastener and hinge means at upper portions thereof, and a closure member for the upper portion of the open top of said receptacle, said closure member including a planar horizontal upper member conforming in size and shape with said base member, having a liner covering the lower surface thereof, and vertically arranged second wall means surrounding said upper member and having a notch, fastener and hinge means in lower portions of the same at the same locations as that in the upper portions of said first wall means, whereby a tobacco product may be placed upon said support, the receiver closed, air for supporting combustion will enter the vent means in the base member, and smoke issueing from the product will contact the liners and pass out through the notched portions in said wall means, and means on the lower face of said base member for supporting the receptacle above said flat surface whereby air may flow into and through said base member vent means.

3,921,647
APPARATUS FOR ISOLATING AND TREATING SELECTED HAIR STRANDS

Karol C. Fisher, 183-11 Hillside Ave., Queens, N.Y. 11432

Filed Oct. 2, 1974, Ser. No. 511,559
Int. Cl.² A45D 2/12
U.S. Cl. 132—9 6 Claims

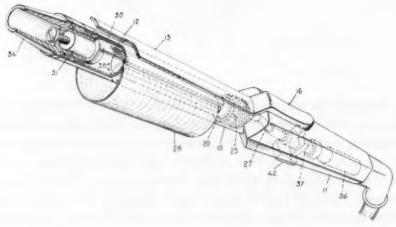


1. Apparatus for application of chemicals to selected hair strands comprising a clamp platform, the platform including:
a pair of opposed jaws;
a planar surface operable with said jaws so that when the selected hair is positioned between and held by the jaws, said planar surface presses against the scalp and adjacent and unselected hair immediately thereunder; and,
clip means in the form of a U-shaped resilient clip slidable on the platform and acting to compress said jaws.

3,921,648
HAIR CURLING IMPLEMENT

George Barradas, 15 Riverview Court, Glenville, Conn. 06830

Filed Jan. 2, 1975, Ser. No. 538,083
Int. Cl.² A45D 2/24
U.S. Cl. 132—37 R 11 Claims

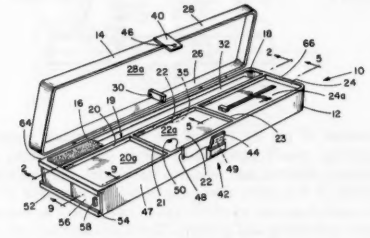


1. A hair curling implement comprising
an elongated curling arm,
the curling arm having an elongated tubular barrel with a longitudinally extending slot therein;
steam generating means mounted within said barrel;
a clamping arm pivotally mounted on the curling arm and adapted in the clamped position to cooperate with a longitudinally extending upper region of the barrel;
an expansible mandrel constituted by a resilient perforate screen anchored along one longitudinal edge to the barrel and extending through said slot,
the perforate screen being looped into a generally cylindrical configuration encircling a longitudinally extending lower region of the barrel,
said lower region of the barrel having perforations for the passage of steam from the steam generating means to the interior of the mandrel;
a rotary anchoring member mounted within the barrel for rotation about a longitudinal axis, the anchoring member providing a longitudinally extending arm offset from said axis,
the screen being anchored along a second longitudinal edge to said arm of the anchoring member; and
manually rotatable means mounted on said curling arm and coupled to the anchoring member for rotating the anchoring member whereby to expand or contract the mandrel.

3,921,649
DENTAL CARE KIT

Mary Guenther Milbrath, 2310 Edna Ave., Park Ridge, Ill. 60068

Filed June 19, 1974, Ser. No. 481,001
Int. Cl.² A45D 44/18
U.S. Cl. 132—84 D 3 Claims

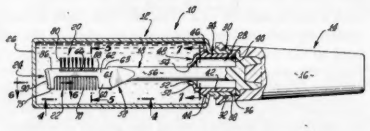


1. A dental care kit comprising a case having a plurality of compartments adapted to receive a corresponding number of different articles, including a toothbrush and dental floss, useful for dental hygiene, a cover hingedly attached to said case, stop and support members integrally formed with said case and cover and cooperatively arranged to secure said toothbrush in an elevated position in one of said compartments when said cover is closed, at least one closure in a sidewall of said case providing an outlet for dispensing one of said articles received in one of said compartments, a dental floss opening in said case, and a clasp, adjacent said dental floss opening, having a tongue and a latch member cooperatively arranged to maintain said cover and case in a closed condition, said latch member being provided with a dental floss cutting edge, whereby interaction between said tongue and latch member will result in the closure of the cover and the simultaneous entrapment of the cut end of the dental floss.

3,921,650
COSMETIC APPLICATOR AND CONTAINER

Robin M. Montgomery, Sherman Oaks, Calif., assignor to Max Factor & Co., Hollywood, Calif.

Filed Dec. 23, 1974, Ser. No. 535,616
Int. Cl.² A45D 40/26
U.S. Cl. 132—88.7 16 Claims



1. In a cosmetic package for use in the application of mascara to eyelashes,
a container having mascara therein, said container being provided with access opening;
an applicator including a comb portion, a handle portion, and a rod portion interconnecting said handle and comb portions,

said comb and rod portions being removably inserted in said container through said opening to immerse said comb portion in said mascara,

said comb portion having plurality of elongated teeth extending from a base portion to the tips of said teeth to define a cross-sectional configuration which is relatively elongated in one dimension and relatively thin in the other dimension;

wiper means mounted on said container adjacent said container opening for wiping the rod and comb portions of said applicator as they are withdrawn from said container, said wiper means including an approximate frusto-conical annular lip of a resilient, elastic and flexible material converging inwardly of the container with its terminal inner edge surface in complete contact encirclement of the rod when the applicator is in place in the container and defining a stretchable opening through which said applicator is inserted and withdrawn,

said lip being axially reversible by withdrawal of the applicator to position the reversed surface of the lip in complete wiping encirclement of the rod;

the improvment comprising:

a brush portion having bristles extending from a brush base adjacent the base portion of the comb,

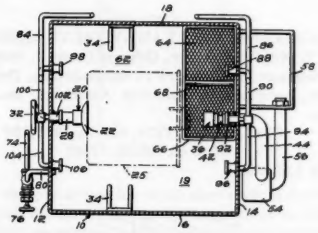
said wiper means by withdrawal beyond the rod being resiliently deformed and stretched by the brush and comb portions to an elongated configuration conforming generally to the peripheral surfaces of the comb portion and of depressed brush portion in contact wiping relationship with the tips of the comb teeth and the brush brisles and in general wiping relationship with the edges of the comb teeth as the comb and brush portions pass outwardly through the wiper means,

whereby excess mascara is removed from said comb portion and substantially all mascara is removed from said bristles.

3,921,651
POT-WASHING MACHINE

Clyde R. Weihe, Jr., Newton, Mass., assignor to Adamation, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 357,499, May 4, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,063
Int. Cl.² B08B *9/00*
U.S. Cl. 134—57 DL **11 Claims**



1. A washing machine which comprises:

a cabinet including two side walls, a front wall, a bottom wall, and a back wall, said walls defining a cleaning zone;

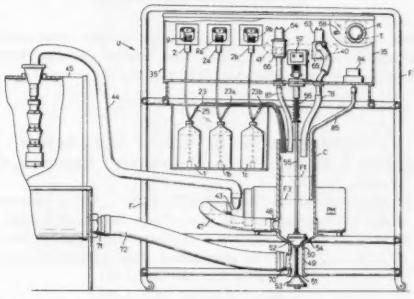
a vacuum system which includes a sealing member disposed within said zone, secured to one of said walls, and adapted to engage a base surface of a culinary article to be cleaned in a seal-tight manner, and a vacuum pump in communication with said sealing member to establish a vacuum between the engaged surface of the article and said sealing member, whereby the article is secured to the sealing member and within the zone in a fixed manner;

means for providing a high-pressure spray disposed within said zone, secured to another of said walls opposed to said one of said walls, said spray means being directed toward said one of said walls and spaced apart from said vacuum system, said spray means including a high pressure nozzle adapted to direct the spray against an interior surface of the article to be cleaned opposed to said base surface, and means for supplying liquid to said nozzle under high pressure, whereby the liquid is discharged under high pressure and contacts said interior surface of the article to be cleaned.

3,921,652
APPARATUS FOR AUTOMATICALLY MIXING A CLEANING SOLUTION FOR AUTOMATIC CLEANING EQUIPMENT FOR DAIRIES OR THE LIKE

Rolyn A. Schmid, Hayward, Wis., assignor to Bender Machine Works, Inc., Hayward, Wis.

Filed Sept. 30, 1974, Ser. No. 510,314
Int. Cl.² B08B *9/08*
U.S. Cl. 134—58 R **7 Claims**



1. Control apparatus for automatically preparing a washing solution and also for cleaning equipment, said apparatus including a plurality of plunger type pump means each including an electric motor for driving said pump means in a fluid pumping direction, a fluid container for each of said pump means, a first conduit between the interior of each of said containers and its respective pump means whereby said pump means can draw fluid from its container and into its first conduit, one-way valve means in each of said first conduits, a second conduit extending from each of said first conduits and in communication therewith and for discharging fluid into a mixing tank or the like, a timer motor having a connection with said electric motors of said pump means so as to operate said pump means in programmed relationship to one another and thereby pump various materials into said mixing tank or the like, the solenoid operated valve means operated by said timer motor for permitting water to be conducted into said mixing tank to thereby form a washing solution with said various fluids, and a fluid moving device for conveying said solution through said equipment to be cleaned, and an electrical contactor means for controlling said fluid moving device.

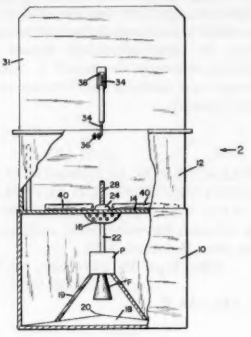
3,921,653
WASHING AND DEGREASING MACHINE

Paul H. Ducharme, Dudley, Mass., assignor to Fabco Metal Products, Inc., Dudley, Mass.

Filed July 30, 1973, Ser. No. 384,126
Int. Cl.² B08B *3/06*
U.S. Cl. 134—102 **5 Claims**

1. A cleaning and degreasing machine including a reservoir chamber and a superposed cleaning chamber with a bottom, the reservoir chamber having a sloping pyramidal floor with a central high point and lower level outside edges, means pumping the cleaning solution up from the reservoir chamber to the cleaning chamber, said means including a pump, filter and solution intake directly above the highest portion of the slop-

ing floor of the reservoir chamber, and including a flexible tube in said cleaning chamber supplied with solution thereby,



and a drain leading from the cleaning chamber to the reservoir chamber centrally located in the bottom of said chamber directly above the said high point of the floor.

3,921,654

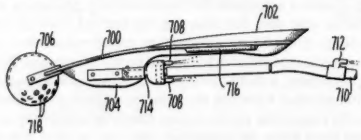
AUTOMATIC SWIMMING POOL CLEANER

Andrew L. Pansini, 180 Los Cerros Drive, Greenbrae, Calif. 94904

Continuation of Ser. No. 150,427, June 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 91,285, Nov. 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 62,588, Aug. 10, 1970, abandoned. This application Aug. 13, 1973, Ser. No. 388,340

Int. Cl.[2] B08B *3/02, 9/08*

U.S. Cl. 134—167 R **19 Claims**



1. A swimming pool cleaner comprising a carrier having a net positive buoyancy when deactivated and embodying means operable in response to forward movement of the carrier to impart submerged diving movement thereto, drive means to impart forward movement to said carrier, a flexible fluid supply conduit in flow supplying communication with said drive means and adapted to be towed by said drive means, and a roller-like, anti-friction bumper member carried by said carrier at the leading end thereof adapted, as a result of engagement with a pool surface, to rotate and to redirect movement of said carrier within a pool.

3,921,655

UMBRELLA FRAME

Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Canada

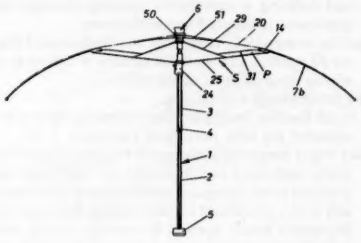
Filed Dec. 3, 1973, Ser. No. 420,907

Claims priority, application Germany, Dec. 7, 1972, 2259875

Int. Cl.[2] A45B *19/00*

U.S. Cl. 135—20 R **3 Claims**

1. An umbrella including a frame having a telescopic stick comprising at least two axially collapsible sections, a crown at one end of the stick, a main runner slidable on the stick, an auxiliary runner slidable on the stick between the main runner and the crown, means associated with the main runner and the stick for preventing rotation of the auxiliary runner relative to the stick but allowing axial sliding movement of the auxiliary runner on the stick, stretcher members hinged to the main runner, strut members hinged to the auxiliary runner and to the stretcher members, a non-telescopic dome rib hinged to a free outer end of each stretcher member with an inner end portion of the dome rib extending beyond the hinge point with the stretcher member, a link member hinged to the inner end of the dome rib members and the strut member and forming a parallelogram link assembly which is foldable adjacent the telescopic stick in each of two collapsed conditions of the umbrella frame, an umbrella dome fabric attached to the crown and extending radially therefrom, means securing the umbrella fabric to the dome ribs adjacent both ends of the dome ribs and forming a free, unsupported, flexible portion between the crown and the inner ends of the dome ribs, said



umbrella frame being collapsible to a first condition in which the strut members, stretcher members, link members and dome ribs are folded into overlying relationship and the auxiliary runner and main runner are in a spaced relationship remote from the crown at a distance determined by the distance said free, flexible, unsupported dome fabric is substantially stretched along the extended, telescopic stick, and said folded parallelogram linkage integrating movement of the auxiliary runner and main runner as a unit to a second collapsed condition of said umbrella frame where the stick sections are telescoped until the auxiliary runner is positioned adjacent said crown and the free, flexible, unsupported portion of said dome material can drape over and outside of the collapsed parallelogram linkage whereby the umbrella can be readily packaged.

3,921,656

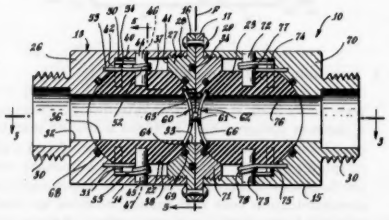
SELF-CLOSING BREAKAWAY VALVE ASSEMBLIES

Daniel T. Meisenheimer, Jr., Orange; Daniel T. Meisenheimer, III, Seymour, and Richard C. Meisenheimer, Orange, all of Conn., assignors to Spectrum Associates, Inc., Milford, Conn.

Filed June 20, 1974, Ser. No. 481,205

Int. Cl.[2] F16K *17/40*

U.S. Cl. 137—68 **19 Claims**



1. A self-closing breakaway valve assembly comprising:

A. a first valve housing having a first rotatable valve member rotatably mounted therein, said first valve housing

and first rotatable valve member each having a bore formed therethrough, said bores being aligned when said first rotatable valve member is in an open position to provide a passage through said first valve housing, and said first rotatable valve member spring biased to rotate to a closed position wherein the bores of said first rotatable valve member and said first valve housing are misaligned to block the passage through said first valve housing;

B. a second valve housing having a second rotatable valve member rotatably mounted therein, said second valve housing and said second rotatable valve member each having a bore formed therethrough, said bores being aligned when said second rotatable valve member is in an open position to provide a passage through said second valve housing, and said second rotatable valve member spring biased to rotate to a closed position wherein the bores of said second rotatable valve member and said second valve housing are misaligned to block the passage through said second valve housing;

C. frangible means connecting said first and second valve housings with the bores formed therethrough in alignment; and

D. trigger means positioned within the aligned bores formed through the connected first and second valve housings, said trigger means engaged between said first and second rotatable valve members to hold them in their open positions, wherein separation of said first and second valve housings upon fracture of the frangible connecting means releases said trigger means engaged between said first and second rotatable valve members and permits said first and second rotatble valve members to rotate to their closed positions.

3,921,657

FIRE DAMPER DEVICE

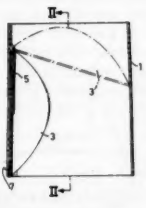
Nils Randolf Bergmark, Byske, and Karl-Gunnar Torbjorn Johansson, Ersmark, both of Sweden, assignors to Futurumverken AB, Byske, Sweden

Filed Sept. 4, 1974, Ser. No. 503,080

Claims priority, application Sweden, Sept. 12, 1973, 7312425

Int. Cl.² F16K *17/38*

U.S. Cl. 137—75 **6 Claims**



1. A fire damper device for an air duct such as an evacuation duct from a kitchen, arranged automatically to close the duct when hot gases flow through the duct, comprising a pipe section, a valve flap movable in the pipe section between an open position, in which the valve flap lies adjacent and conforms to the inner contour of the pipe section, and a closed position, in which the valve flap closes substantially the entire area of the pipe section, the axial dimension of the valve flap in its open position being greater than the transverse dismension of the pipe section that in its closed position, the valve flap assumes an oblique position in the pipe section with its edges forming a direct seal with the pipe section walls, a flat elongated leaf spring having one end attached to the valve flap and extending over the edge thereof in the flow direction through the duct, the opposite end of the leaf spring being attached to the pipe section wall downstream of the valve flap, a fastening compound located between the valve flap and the wall of the pipe section and attaching the upstream portion of the valve flap directly to the pipe wall, the fastening compound being heat responsive so as to melt and release the valve flap in the presence of hot gases in the duct, and the leaf spring being pretensioned in its flat position to assume a bent position so that upon release of the valve flap by the fastening compound, the spring bends and moves the valve flap from its open to its closed position.

3,921,658

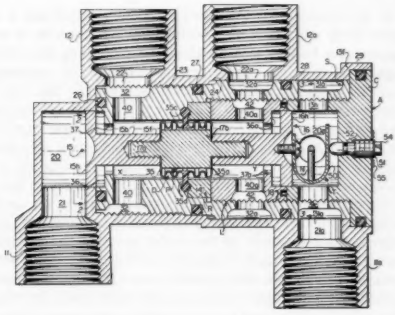
PRESSURE BALANCING VALVE

Irlin H. Botnick, 3155 Kersdale, Pepper Pike, Ohio 44124

Filed Nov. 2, 1973, Ser. No. 412,288

Int. Cl.² G05D *11/16*

U.S. Cl. 137—98 **6 Claims**



1. A valving device to be included in hot and cold water lines for maintaining a hot and cold water flow ratio established at a point of use, despite subsequent variations in the relative hot and cold water supply pressure; comprising

a body providing

a central valving bore,

an inlet and outlet for hot water opening to one half of the bore length at axially spaced locations,

an inlet and outlet for cold water opening to the other half of the bore length and similarly spaced axially, and

a respective similarly located circumferential inward lip or flange constriction between each inlet and outlet providing a fixed flow resistance therebetween;

flexible operatively unstressed elastomeric means at bore mid-length isolating the two halves of the bore into hot and cold water valving chambers;

the said inlets opening radially to said bore at axial locations between said flexible means and a respective said constriction;

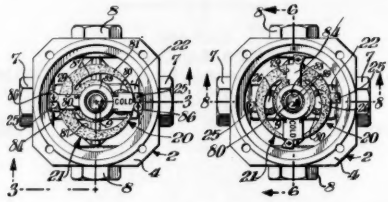
a shuttle type valving device axially shiftable in the bore extending through and secured to said flexible means and providing a respective bore-guided valving member in each chamber and cooperating with a respective formation in the bore at a location between the respective constriction and outlet to form a valved flow area varied by axial shifting of the valve member under change of a differential in inlet hydrostatic pressures applied to the flexible means until nulling of total forces of pressure on the flexible means and dynamic flow pressures and hydrostatic pressures on the valving members,

with each valving flow area decreased as the other is increased by axial shift of said valving device.

3,921,659
MODULAR BALANCED PRESSURE MIXING VALVE WITH CERAMIC VALVE ELEMENTS

Charles J. Rudewick, III, Newark, Del., assignor to Speakman Company, Wilmington, Del.

Filed Dec. 19, 1973, Ser. No. 426,236
Int. Cl.² F16K *19/00*; G05D *7/00*
U.S. Cl. 137—98 **8 Claims**



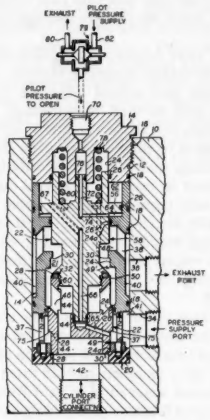
1. A balanced pressure mixing valve comprising a lower valve body with inlet and outlet openings therein, a mating upper valve bonnet with a valve stem extending therethrough capable of rotational movement with respect to the bonnet, a modular pressure balancing cartridge having hot and cold inlet ports in the bottom of the cartridge with sealing means therein for sealing engagement with the inlet openings in said valve body, hot and cold outlet ports in the top of the cartridge with sealing means therein, the cartridge having no sealing means on the sides thereof to facilitate placement in the valve body, diaphragmatic balanced pressure means in the cartridge separating flow of hot and cold water therethrough, ceramic valve seats positioned in the outlet ports of the cartridge, a ceramic regulator disk in sealing, sliding engagement with the ceramic valve seats with openings therethrough and operable by the stem through a limited angle of rotation to bring the disk openings into and out of registry with the ceramic valve seats, said rotational movement controlling both temperature and volume of water flowing through the mixing valve.

3,921,660
THREE-WAY, TWO-POSITION NON-INTERFLOW POPPET VALVE

Slawomir Kowalski, Rockaway, N.J., assignor to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Aug. 15, 1974, Ser. No. 497,759
Int. Cl.² F15B *13/043*
U.S. Cl. 137—236 **16 Claims**

1. A three-way, two-position poppet valve assembly including in combination a main valve element, a housing in which the valve element is enclosed, the housing including a valve chamber, bearings in the housing axially spaced from one another and in which the valve element has sliding axial movement through a stroke, means for supplying working fluid to and from a cylinder including a port opening into the housing, other means for supplying working fluid to the valve housing including a second port opening into the housing, means for exhausting working fluid from the cylinder at the full pressure of the working fluid supply, including a third port opening into the housing, means for moving the valve element through its stroke, valve seats in the housing at opposite ends of the valve chamber, the valve element being within both of said bearings during its entire stroke, and one of said bearings being located axially between the valve seats, poppet valve faces on the valve element in position to contact with the seats to close off communication to and from the chamber, at opposite ends of the valve stroke with the second and third ports respectively, generally cylindrical surfaces of the valve element adjacent to and extending back from each poppet value face in the direction of the poppet valve face at the opposite end of the valve element, generally cylindrical guide surfaces of the housing and in which the generally cylindrical surfaces of the valve element slide with close clearance to prevent any substantial flow of fluid along the side of the valve element while the cylindrical surfaces of the valve element are moving in the cylindrical guide surfaces of the housing, the length of the cylindrical guide surfaces adjacent to each of the poppet valve

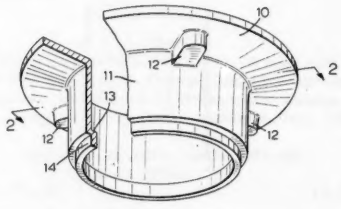


faces being shorter than the stroke of the valve element so that each poppet valve face that is moving toward open position moves beyond and clear of the generally cylindrical guide surface, at the same end of the housing, before the valve element reaches its open position at either end of its stroke.

3,921,661
ADJUSTABLE DRAIN FITTING

John Ernest Emberson, 25 Dogwood Crescent, Scarborough, Ontario, Canada

Filed Dec. 18, 1974, Ser. No. 534,020
Int. Cl.² F16L *5/00*
U.S. Cl. 137—356 **1 Claim**

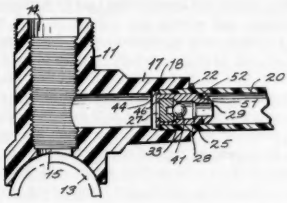


1. A floor drain fitting adapted to be mounted flush with a floor and to be connected with a drain pipe of one of several different types extending below the floor, said drain fitting comprising a generally cylindrical portion, an annular flanged portion integral therewith and extending radially outwardly from one end of said cylindrical portion, an annular lip integral therewith and extending radially inwardly from the other end of said cylindrical portion, said annular lip having a radial part adjoining the generally cylindrical portion and an axial part integral with the radial part, the axial thickness of said radial part of the annular lip being less than the thickness of the other parts of the drain fitting, thereby rendering said lip detachable from the cylindrical portion on impact administered to said lip, to leave a substantially continuous protrusion free inner surface on the cylindrical portion at said other end.

3,921,662
PLASTIC PIPES AND/OR FITTINGS WITH EXCESSIVE FLOW SAFETY VALVES

William L. Hauffe, Warrensburg, and Narayan C. Saha, Decatur, both of Ill., assignors to Mueller Co., Decatur, Ill.

Filed Jan. 2, 1974, Ser. No. 429,852
Int. Cl.² F16K 15/04
U.S. Cl. 137—517 14 Claims



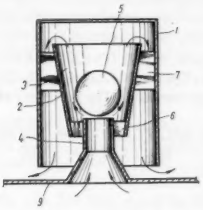
4. In a fluid conducting system including first and second plastic fluid conducting means, said fluid conducting means being joined by a heat fusion process to form at least one fluid passage therethrough, an excessive flow safety valve for preventing the flow of fluid therethrough when the differential in pressure across said valve exceeds a preset level, said valve comprising a threadless body having a fluid flow passage therethrough, said passage terminating in a valve element seating portion, a ferromagnetic valve element, magnetic means for normally maintaining said valve element spaced from said seating portion of said body, wherein fluid normally flows around said valve element and through said passageway from one end of said safety valve to the other end thereof and wherein when the pressure differential across said valve exceeds a predetermined level, said valve element is forced against said seating portion of said valve body to thereby prevent the flow of fluid through said safety valve, resilient means for maintaining said safety valve in one of said fluid conducting means prior to joining said first and second fluid conducting means, said resilient means extending about the outside periphery of said valve body and engaging the inside periphery of said one fluid conducting means in which said safety valve is positioned wherein said resilient means prevents the flow of fluid along the outside periphery of said valve from one end to the other end thereof, and means for permanently retaining said safety valve in a preselected position in said fluid conducting system after said first and second fluid conducting means are joined, said retaining means including at least one surface bearing against one of said fluid conducting means to impart a force along the longitudinal direction thereof.

3,921,663
CAP FOR INLET OF FLUID INTO A FLUIDIZED BED

Jaroslav Beranek, Prague, Czechoslovakia; Vladimír Bažant, deceased, late of Prague, Czechoslovakia; by Vera Bažantova, heir, Prague, Czechoslovakia; by Petr Bažant, heir, Prague, Czechoslovakia; by Ondrej Bažant, heir, Prague, Czechoslovakia; by Jan Bažant, heir, Prague, Czechoslovakia; by Vladimir Bažant, heir, Prague, Czechoslovakia; Robert Rössler, Jirkov, Czechoslovakia; Jaroslav Dobrozemský, Roznov pod Radhostem, Czechoslovakia; Vratislav Fibinger, Ostrava, Czechoslovakia; Josef Dolanský, Jirkov, Czechoslovakia, and Jaroslav Vávra, Ostrava, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Sept. 10, 1973, Ser. No. 395,853
Claims priority, application Czechoslovakia, Sept. 11, 1972, 6212-72
Int. Cl.² F16K 15/04
U.S. Cl. 137—533.11 7 Claims

1. A cap for the inlet of fluid into a fluidized bed with a constant pressure drop, said cap comprising an outer housing in the form of an inverted cup having a vertical side wall and an upper end wall, a tubular element vertically disposed in the housing, the side wall and upper end of the element being positioned spaced from the side walls and the upper end wall of the housing, respectively, an inlet pipe communicating with the lower end of the tubular element for feeding fluid into the internal space of the element and thence into the internal space of the housing, a float disposed within the internal space

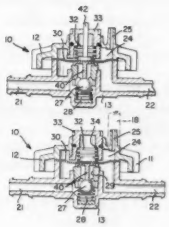


of the element for free movement with respect thereto, the element, the inlet pipe and the float being coaxial, the float having the shape of a body of revolution, at least the bottom part of the float being spherical, the fluid introduced through the inlet pipe passing vertically upwardly in the element past the float and being diverted by the upper end wall of the housing to flow downwardly within the housing and to escape laterally from beneath the lower edge of the side wall of the housing.

3,921,664
VACUUM POWERED BALL VALVE FUEL CONTROL

Edgar W. Almquist, Milford, Pa.

Filed Feb. 26, 1974, Ser. No. 446,069
Int. Cl.² F16K 37/00
U.S. Cl. 137—553 8 Claims



1. A vacuum powered ball valve fuel control device comprising:
- a housing;
- a vacuum chamber within said housing;
- a fluid inlet passage to said chamber for providing fuel under pressure;
- a fluid outlet passage from the said chamber;
- a passage between said fluid inlet and said fluid outlet passage;
- first resilient means below said intermediate passage;
- a ball seated on said first resilient means and urged by said resilient means into position in proximity to the opening on one end of said intermediate passage;
- a flexible diaphragm disposed across said intermediate passage;

second resilient means supported within the chamber and having one part thereof free for normally exerting pressure on said diaphragm tending to close the line opening into the intermediate passage;

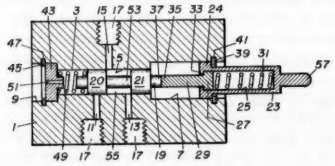
said ball moving in the first opening against the action of said first resilient means to close the opening at one end of said intermediate passage under the pressure of fuel from said inlet passage to permit the fuel to flow toward said outlet passage.

3,921,665

LIMIT VALVE WITH OVERTRAVEL DETECTOR

Joseph Lebzelter, Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1974, Ser. No. 533,561
Int. Cl.² F16K *37/00*
U.S. Cl. 137—553 **10 Claims**



1. In combination:

a fluid valve including a movable valve member having a normal safe operating path and an unsafe overtravel path; a normally-closed poppet valve comprising a poppet guide and a spring-pressed poppet slidable in said guide and positioned to be engaged and moved by said valve member in its overtravel path to open said poppet valve; means for applying fluid pressure to the interior of said guide; and

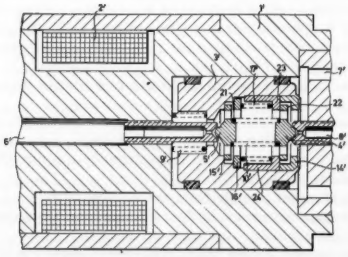
means, responsive to the release of said fluid from said guide when said poppet valve is opened by said valve member, for producing a fluid signal indicating the overtravel motion of said valve member.

3,921,666

VALVE WITH A PLURALITY OF CONNECTIONS

Heinz Leiber, Leimen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Nov. 23, 1973, Ser. No. 418,194
Claims priority, application Germany, Nov. 22, 1972, 2257213; Mar. 8, 1973, 2311408
Int. Cl.² F15B *13/044*, *13/043*
U.S. Cl. 137—557 **19 Claims**



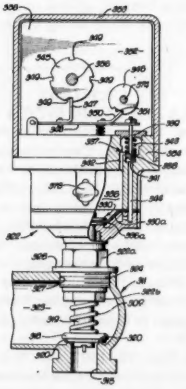
1. A solenoid operated valve with a plurality of connections comprising: a valve body; first and second connections in said valve body; at least one further connection in said valve body; an armature in said valve body and movable into a first position in which said first connection is closed, a second position in which said second connection is closed and an intermediate position in which both said first and second connections are closed; a first closure member for closing said first connection in said first and intermediate positions of said armature; a second closure member for closing said second connection in said intermediate and second positions of said armature; first lost motion means for connecting said first closure member to said armature and whose lost motion is fully taken up in a position between said intermediate position and said second position of said armature when moving to said second position; second lost motion means connecting said second closure member to said armature and whose lost motion is fully taken up in a position between said intermediate position and said first position of said armature when moving to said first position; first passage means connecting said first connection with a said further connection when said first connection is open; second passage means for connecting said second connection with said further connection when said second connection is open; a spring normally urging said armature into its said first position; spring means for urging said first and second closure members into positions spaced apart; means for providing a spring force which is directed against movement of said armature upon reaching said intermediate position when said armature is moving toward said second position; a single solenoid mounted on said valve body in a position to cause said armature to move from said first position toward said intermediate and second position when said solenoid is energized; and control means connected to said solenoid for selectively supplying a first control current to said solenoid which is sufficient to overcome the force of said spring and said spring force to move said armature to said second position, and a second control current to said solenoid which is sufficient to overcome only the force of said spring to move said armature to said intermediate position.

3,921,667

BATTERY OPERATED, FLUID PRESSURE RESPONSIVE VALVE CONTROLLER

Robert F. Corliss, Hacienda Heights, and Frank Wilkinson, Monrovia, both of Calif., assignors to Tyme Valve Corporation, South El Monte, Calif.

Continuation-in-part of Ser. No. 216,397, Jan. 10, 1972, abandoned. This application Aug. 7, 1973, Ser. No. 386,395
Int. Cl.² F16K *31/36*
U.S. Cl. 137—624.15 **14 Claims**



1. For use in a pressurized water supply system including a main valve body through which water flow is to be controlled, the combination comprising:

a. main valving means including a stopper projecting for installation and movement in the body to control water flow in the system, and

b. control means adapted to be mounted on the body and operable to cycle the movement of said main valving means at predetermined time intervals, the control means including an actuator piston connected with the stopper and carried to receive application of said pressure,

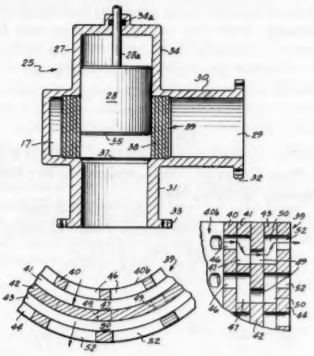
c. the control means including a single control valve communicating with the upper side of the piston and operable to bleed water pressure supplied to the piston at times when the piston is in a position in which system water pressure urges the stopper and piston to main valve open position,

d. said control means including rotary cam and follower structure comprising multiple cams rotatable at different rates and followers engageable therewith, transducer means responsive to battery current to effect rotation of the cam structure to displace the follower structure, and a spring biased actuator operatively connected between the follower structure and the control valve, the actuator biasing the follower structure into engagement with the rotary cam structure and having an advanced position in which the control valve is closed to shut off said bleed and a retracted position in which the control valve is open to pass said bleed.

3,921,668
HIGH ENERGY LOSS ROLLED STRIP FLUID CONTROL DEVICE

Richard E. Self, 3221 Brimhall Drive, Los Alamitos, Calif. 90720

Filed Dec. 10, 1973, Ser. No. 423,314
Int. Cl.² F16K 47/00
U.S. Cl. 137—625.3 **14 Claims**



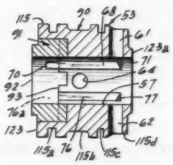
1. In an energy loss fluid control device adapted for installation in a fluid transfer system to create a frictional drag and pressure drop on the fluid for dissipating potential energy of the fluid without developing noise, the improvement which comprises a cage receiving the fluid radially therethrough composed of a tubular coiled punch strip with a plurality of tightly wrapped overlying layers with the punchings of an underlying layer registering with the punchings of an overlying layer and arranged relative to each other in the successive layers to provide a myriad of axially separated flow paths connecting the inner and outer peripheries of the tubular coil and with the punchings in adjacent layers arranged so that each flow path has abrupt turns whereby fluid passing through the cage is divided into a myriad of small streams and each stream must traverse a flow path with abrupt turns before it can exit from the cage, whereby no path extends directly between the interior and exterior of the cage, and no path communicates with an adjacent axial path.

5. A cage for an energy loss fluid flow control device which comprises a tubular coiled metal strip having a plurality of tightly wrapped overlying layers punched to provide a plurality of axially separated alternating orifices and circumferentially elongated wide channels communicating with the orifices in adjacent layers only in off-set relation to cause fluid flowing through the cage to be sub-divided into a myriad of streams each of which has abrupt turns for dissipating energy from the fluid, whereby no path extends directly between the interior and exterior of the cage and no path communicates with an adjacent axial path.

3,921,669
INTEGRAL POWER STEERING GEAR AND SINTERED METAL VALVE SLEEVE THEREFOR

Raymon L. Goff, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 245,951, April 20, 1972, abandoned.
This application May 10, 1974, Ser. No. 468,688
Int. Cl.² F16K 11/12
U.S. Cl. 137—625.24 **10 Claims**



1. A valve assembly including a valve sleeve comprising first and second valve elements formed of sintered metal and physically bonded together in abutting end-to-end relationship to define a unitary valve structure having generally cylindrically shaped inner and outer peripheral wall surfaces forming the inner and outer peripheral confines of said valve sleeve, a pair of first and second axially extending fluid flow passages opening into said inner peripheral wall surface, said first and second passages being spaced circumferentially about said inner peripheral wall surface, said first and second valve elements having interlocking abutting ends which include a plurality of cooperating abutting and generally axially extending bonding surfaces intersecting said inner peripheral wall surface and circumferentially spaced between said first and second passages.

3,921,670
MAGNETICALLY OPERATED VALVE WITH SPIDER ARMATURE

William L. Clippard, Jr., and Kaarel Kaera, both of Cincinnati, Ohio, assignors to Clippard Instrument Laboratory Inc., Cincinnati, Ohio

Filed July 1, 1974, Ser. No. 484,622
Int. Cl.² F16K 11/04, 31/02
U.S. Cl. 137—625.65 **12 Claims**

9. A magnetically operated valve comprising,

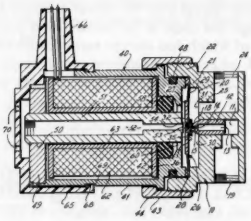
body structure presenting a chamber and a first port entering said chamber,

another port also entering said chamber,

a spider positioned in said chamber and including at its center a magnetically responsive armature having a transverse face engaging and closing the first port,

said spider also including a plurality of springs angularly spaced around and connected to said armature and radially supporting the armature so that it can be displaced axially away from said first port,

said springs outwardly being connected to mounting means at a position offset axially from said first port, such that said springs are stressed and said armature is pressed and biased against said first port by the stressing of said springs,



the stressing of the springs which radially support the armature being the sole force which biases the armature against said first port,

and an electric coil having a core magnetically responsive to energization of said coil, said core positioned to act magnetically on said armature to draw it away from said first port against the biasing thereon of said springs.

3,921,671

ELECTROMAGNETIC VALVE FOR MOLTEN METAL

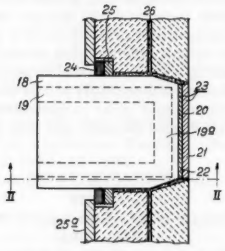
Staffan Granstrom, and Ingemar Goransson, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 16, 1974, Ser. No. 533,185

Claims priority, application Sweden, Dec. 19, 1973, 73171209

Int. Cl.² F15B *21/00*

U.S. Cl. 137—807 **5 Claims**



1. An electromagnetic valve for molten metal, comprising a refractory body forming a hole through which said metal can flow, means for forming a magnetic flux field transversely across said hole, and two electrodes extending through said body transversely with respect to said hole and said flux field, said electrodes having cooling means and being made at least mainly of copper and each electrode having an inner end contacted by said metal and protected by a composite cladding formed by an inner layer that is at least mainly copper and an outer layer that is a metal more wear-resistant but less heat-conductive than said inner layer, said layers being weld-bonded together and said inner layer being fixed to said electrode by a film of solder.

3,921,672

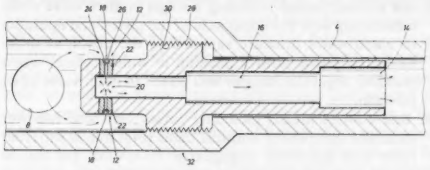
CHOKE FOR CONTROLLING FLOW OF PRESSURIZED FLUID

James F. Arnold, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Filed July 1, 1974, Ser. No. 484,793

Int. Cl.² F15D *1/02*

U.S. Cl. 138—42 **9 Claims**



1. A choke for controlling the flow of a pressurized gas in a conduit from a high upstream pressure to a lower downstream pressure and wherein the pressurized gas includes a freezable substance entrained therein which forms ice on the downstream side of the choke in response to the gas undergoing a pressure drop across the choke, which ice is capable of accumulating in sufficient quantities to block passage of the gas through the choke, said choke comprising:

a choke body having inlet means for receiving the pressurized gas and outlet means of larger cross section than said inlet means for permitting expansion of said gas and for discharging said gas at a lower downstream pressure;

said inlet means including at least two orifices, each orifice being arranged for passage of a portion of said gas therethrough to a lower pressure zone within said larger outlet means, said orifices being positioned in said body such that the discharge ends thereof are angularly aligned relative to each other to thereby cause the streams discharging from said orifices to impinge against each other in said lower pressure zone generally proximate the points of discharge from said orifices whereby said freezable substance is precluded from accumulating in the form of ice in sufficient quantities to block passage of the gas through the choke.

3,921,673

PROTECTIVE INSERT FOR LINED FLANGED CONDUIT

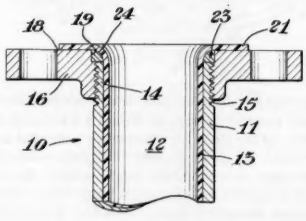
Richard E. Pero, Essexville, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 29, 1973, Ser. No. 364,786

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F16L *9/18, 57/00*

U.S. Cl. 138—109 **4 Claims**



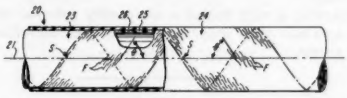
1. In a lined conduit, the lined conduit comprising a rigid outer casing, the outer casing having at least one end, a conduit flange disposed on and affixed to said end, the conduit having a synthetic resinous thermoplastic liner, the liner adjacent said end additionally forming a generally radially extending liner flange disposed generally adjacent to the conduit flange, the improvement which comprises

an annular inwardly facing groove defined by the junction of the conduit and the conduit flange has an annular insert disposed within the groove, the annular insert having a generally outwardly facing curved surface which provides a generally smooth transition surface between the inner surface of the conduit casing and the conduit flange disposed on said casing, thereby lessening failure of the liner in the region of said junction of the conduit and the conduit flange under service conditions.

3,921,674
HOSE CONSTRUCTION AND METHOD OF MAKING SAME

Arthur D. Logan, and James B. Rush, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 18, 1974, Ser. No. 452,471
Int. Cl.² F16L *11/08*
U.S. Cl. 138—130 **13 Claims**

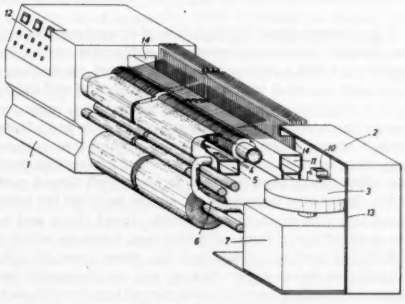


1. A hose construction having a reference axis and comprising an inner layer portion made primarily of an elastomeric material and another layer portion bonded against said inner layer portion and cured therewith as an integral part thereof, said other layer portion being made of an elastomeric matrix compound having randomly distributed elongated fibers embedded therein in substantially parallel relation, said fibers extending in a helical pattern about said axis at a predetermined angular relationship relative thereto, said fibers providing reinforcement for said hose construction.

3,921,675
FLAT WEAVING MACHINE

Walther Filter, Langenhagen, and Claus Filter, Rethem, Aller, both of Germany, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Continuation-in-part of Ser. No. 380,063, July 17, 1973, abandoned. This application Nov. 21, 1974, Ser. No. 525,724
Claims priority, application Austria, Aug. 1, 1972, 6647/72; Italy, July 16, 1973, 12736/73; Israel, July 17, 1973, 42758; United Kingdom, July 16, 1973, 33795/73
Int. Cl.² D03J *1/00*
U.S. Cl. 139—1 C **9 Claims**



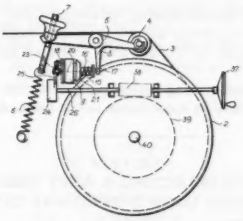
1. A flat weaving machine which defines a weaving area, comprising

1 substantially closed housing means laterally of the weaving area and defining a housing chamber,
a the housing means having openings therein for permitting laterally extending portions of the weaving machine to extend beyond the weaving area into the housing means and some air to escape therefrom, and
b the housing means being closed off from the weaving area,
2 blower means having a suction inlet and a compressed air outlet,
3 suction conduit means having outlet means and inlet means for receiving air laden with particles in the weaving area,
a the suction conduit means being in communication with the suction inlet of the blower means for drawing the air laden with particles,
4 trap chamber means connected to the suction conduit outlet means and permitting the particles in the air drawn into the trap chamber means by the blower means to settle,
5 filter means arranged between the trap chamber means and the compressed air outlet of the blower means, and
6 the compressed air outlet of the blower means communicating with the housing chamber and delivering thereto a sufficient excess of air over any air escaping therefrom to maintain a superatmospheric pressure therein, the blower means sucking the air laden with particles through the suction conduit means, the trap chamber means and the filter means and delivering filtered compressed air free of the particles through the outlet into the housing chamber.

3,921,676
WARP LET-OFF MOTION

Josef Pech; Vladimir Kriz, and Zbynek Nespesny, all of Brno, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed June 4, 1973, Ser. No. 366,659
Claims priority, application Czechoslovakia, June 2, 1972, 3813-72
Int. Cl.² D03D *49/06*
U.S. Cl. 139—110 **7 Claims**



1. In a weaving machine, having a machine drive, a warp tension sensor responsive to the changes in warp tension by varying its position, a warp and a warp let-off motion including means for driving the warp beam from the machine drive via an eccentric motion, one-way clutch and a self-locking transmission, the improved warp let-off motion which comprises a pivotally mounted body driven from the weaving machine drive, a connecting means movably mounted in said body, one end of the movable connecting means being connected to the warp tension sensor, a slide means mounted in the body for sliding perpendicularly to the axis of pivotal mounting of the body, the other end of the connecting means being pivotally connected to the slide means; the one-way clutch having a swinging arm and a connecting rod, connecting the slide means with the swinging arm of the one-way clutch.

3,921,677
FLAT WEAVING MACHINE

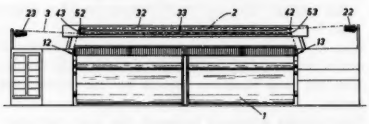
Walther Filter, Langenhagen, Germany, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Continuation-in-part of Ser. No. 379,410, July 16, 1973, abandoned. This application Jan. 3, 1975, Ser. No. 538,322

Claims priority, application Austria, July 27, 1972, 16457/72

Int. Cl.² D03D *47/34*

U.S. Cl. 139—122 H **3 Claims**



1. In a flat weaving machine which is operable to form a shed to withdraw a filling thread having a thickness up to a predetermined upper limit from a bobbin, to insert said thread into said shed at a point of entrance in a succession of shoots, and to cut off said thread after each shoot, and comprising a stationary bobbin holder for holding said bobbin, the improvement of

1. a straight, stationary filling thread guide duct disposed between the bobbin and the point of entrance,
   a. the guide duct having a length approximately corresponding to the width of the weaving machine and an inside width in excess of the upper limit of the filling thread thickness,
   b. the guide duct being arranged to guide a thread from the bobbin to the point of entrance, and
   c. the bobbin and guide duct being so positioned in relation to each other that the path of the filling thread from the bobbin to the guide duct is substantially in a straight line with the duct,
2. a first thread-sensing means disposed between the bobbin and the duct and responsive to the presence of a thread, and
3. a second thread-sensing means disposed between the duct and the point of entrance and responsive to the movement of the thread from the duct to the point of entrance,
   a. the thread-sensing means permitting the filling thread to be stored in loose loops in the guide duct.

3,921,678
DEVICE FOR SELECTING A WEFT THREAD IN A SHUTTLELESS LOOM SUPPLIED BY EXTERNAL SPOOLS

Jacques Palencher, Troyes, France, assignor to Societe Lebocey Industrie, Troyes (Aube), France

Continuation of Ser. No. 308,468, Nov. 21, 1972, abandoned. This application Jan. 13, 1975, Ser. No. 540,561

Claims priority, application France, Nov. 24, 1971, 71.42129

Int. Cl.² D03D *47/38*

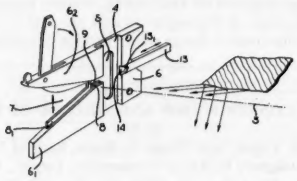
U.S. Cl. 139—122 **5 Claims**

1. A device for selecting a weft thread in a shuttleless loom comprising:

a. a plate having first and second members which define an open space thereinbetween, said plate further having a recess therein, said recess being in communication with said open space through a passageway between said members;

b. latching means for opening and closing said passageway, said latching means being movably disposed within said members of said plate and adapted to being tripped by the batten of said loom, the tripping action of said batten activating said latching means;

c. sliding means disposed within said plate, said sliding means being adapted to engage a selected weft thread and to move back and forth through said recess and into said



open space when said latching means opens said passageway,

whereby, a weft thread is alternately selected and passed into said open space and passed back therefrom to said recess.

3,921,679
WOVEN ZIPPER

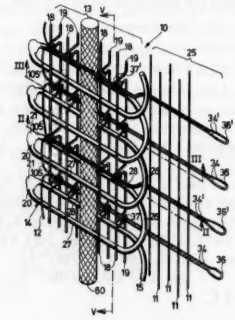
Friedrich Glindmeyer, Stolberg, Rhineland; Wilhelm Friedrich Hennenberg, Alsdorf, and Karl Limpens, Stolberg, all of Germany, assignors to William Pyrm-Werke KG, Stolberg, Rhineland, Germany

Filed June 27, 1974, Ser. No. 483,760

Claims priority, application Germany, June 29, 1973, 2333153

Int. Cl.² D03D *1/00*

U.S. Cl. 139—384 **4 Claims**

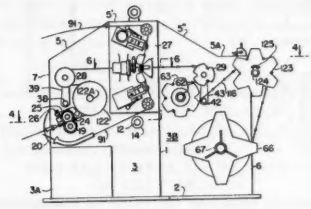


1. In a woven zipper having a row of closure members which are formed from convolutions of a filament woven into a zipper tape and composed of outer curved connecting portions each provided with a coupling projection and extending from a longitudinal margin of the zipper tape, inner curved connecting portions free of zipper-tape threads and adapted to guide a zipper slider, and first and second legs connecting respective ones of said outer and inner connecting portions and substantially superimposed in pairs, weft thread portions of the zipper tape forming in the spaces between the superimposed legs with cover threads which extend above and below the pairs of legs a layer of zipper-tape fabric in which each weft thread portion extends over the upper cover threads and beneath the lower cover threads and an elongated flexible element extending between said pairs of legs through said row of closure members, the weft thread portions which extend above the upper cover threads and the weft thread portions which extend beneath the lower cover threads, being located over or under said flexible element.

3,921,680
BARBED WIRE MACHINE

Pierre Donche-Gay, Buenos Aires, Argentina, assignor to American Engineering Company, Limited, Nassau, Bahamas

Filed July 8, 1974, Ser. No. 486,389
Int. Cl.² B21F *25/00*
U.S. Cl. 140—58 2 Claims

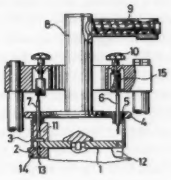


1. A barb wire machine for the manufacture of single strand barbed wire having a main strand and barbs wound at intervals thereon comprising, in combination, a pair of wire forming rollers containing co-acting circumferential grooves through which said rollers pass said main strand deforming said main strand at least in specific places where barbs are to be wound thereon, a box-like frame of said machine, a central main shaft journalled in said frame, a motor having first transmission means driving said main central shaft, a cam mounted on said main central shaft, a cam driven arm pivotally mounted at its center in said frame and having a follower to ride on said cam and having a vertical upstanding portion, two upstanding arms within said frame at opposite ends of said frame, a horizontal bar connected to the tops of said upstanding arms and said upstanding portion of said cam driven arm, spring means urging one of said upstanding arms toward an end of said frame to hold said follower against said cam, exterior upstanding arms on common shafts with said upstanding arms within said frame, said exterior arms having first and second pulleys mounted thereon, a barb winding head assembly on said frame disposed between said first and second pulleys of said exterior upstanding arms, second transmission means connecting said main central shaft to said winding head assembly to drive said winding head assembly, two pairs of barb wire feed rollers on said winding head assembly, third transmission means connected between one of said upstanding arms and each pair of said barb wire feed rollers intermittently driving said pairs of barb wire feed rollers, a third idler pulley disposed above said wire forming rollers and between said exterior upstanding arms, a wire guide pulley disposed between said exterior upstanding arms, fourth transmission means between said central shaft and said wire guide pulley driving said wire guide pulley, said main strand passing from said wire forming rollers about said third idler pulley, passing outward about said first idler pulley to extend through said winding head assembly and then about said second idler pulley, and passing inward about said wire guide pulley, a wire reel, slip clutch means, and a fifth transmission means between said central shaft and said wire reel driving said wire reel through said slip clutch means to wind barbed wire on said wire reel, said main strand being intermittently advanced through said winding head assembly between periods of rest during which barbs are wound on said main strand by said winding head assembly.

3,921,681
APPARATUS FOR FILLING HARD GELATIN CAPSULES OR THE LIKE WITH POWDER

Manfred Rebmann, Schonaich; Roland Rittler, Feilbach; Lothar Bischoff, Keltern, and Theo Moser, Neckarrems, all of Germany, assignors to Robert Bosch Verpackungsmaschinen G.m.b.H., Waiblingen, Germany

Filed Apr. 30, 1974, Ser. No. 465,495
Claims priority, application Germany, May 2, 1973, 2322028
Int. Cl.² B65B *1/24*
U.S. Cl. 141—71 6 Claims

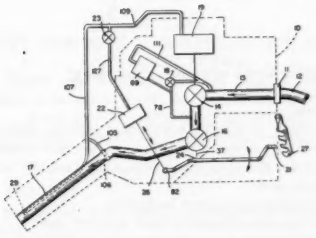


1. An apparatus for filling gelatin capsules or the like with powder comprising, in combination:
   a. a filling material container means for holding powder to be placed in the capsules;
   b. a cyclically rotatable powder dosing disc having a plurality of bores therein;
   c. a plurality of tamping dies operatively arranged to press powder into said plurality of bores in said dosing disc;
   d. means for holding bottoms of the capsules beneath said bores of said dosing disc;
   e. a plurality of transfer dies for pushing pressed molds of the powder in said bores into capsule bottoms when in place in said means for holding; and
   f. a unified closed unit, said filling material container and said powder dosing disc being combined within said closed unit.

3,921,682
AUTOMATIC FUEL DISPENSING NOZZLE

Dean C. McGahey, Fishkill; Eugene W. Vest, Wappingers Falls, and Edward A. Mayer, Newburgh, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 9, 1973, Ser. No. 358,762
Int. Cl.² B65B *3/26*; B67D *5/373*
U.S. Cl. 141—128 2 Claims



1. An automatic fuel dispensing nozzle communicated with a source of fuel, said nozzle having a spout (17) adapted to engage a fuel tank filler tube (28) thereby to form said nozzle, fuel tank and fuel source into a closed fuel system; a fuel conduit (13) in said nozzle, main (16) and secondary (14) flow control valves positioned in said conduit (13), an actuating arm (21) operably connected to said main (16) and secondary (14) flow control valves respectively, and being movable to adjust and lock said respective flow control valves (14

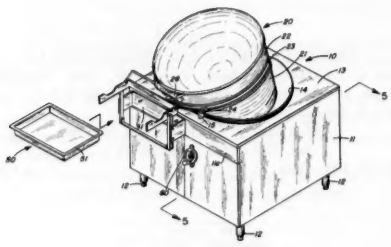
and 16) in an open position to permit a rapid fuel flow through said nozzle to said fuel tank, first valve release means (19) connected to said secondary flow control valve (14), being operable to automatically adjust the latter to a closed position in response to a vacuum condition created at said nozzle spout by a rise of fuel in the latter thereby adjusting said rapid fuel flow to a slower, topping-off fuel flow, second valve release means (22) connected to said main flow control valve (16), being operable to automatically adjust the latter to a fully closed position in response to a second occurring vacuum condition at said spout in response to the rise of fuel in the latter, whereby to achieve complete shut off of fuel flow through said nozzle, and pressure sensing means including a sensing passage (29) opening into said spout, and communicating the latter with said first and second valve release means (19) and (22) respectively, said sensing passage (29) including a selector valve (23) operable when in the open position during said topping-off fuel flow to communicate said second valve release means (22) with said nozzle spout (17), whereby to actuate said second valve release means to close said main valve (14) in response to a vacuum condition at said spout (17), and being further operable when in the closed position during said rapid fuel flow, to be adjusted to an open position in response to an excessive pressure at said nozzle (17) caused by a pressure accumulation in said fuel tank during the filling operation whereby to actuate said second valve release means to close said main valve and discontinue fuel flow to said tank.

3,921,683

TRAY SUPPORT ASSEMBLY FOR USE WITH TILTABLE KETTLES

Elmer S. Vegh, Lyndhurst, and David Schwerzler, Cleveland Heights, both of Ohio, assignors to Alco Standard Corporation, Cleveland, Ohio

Filed Mar. 15, 1974, Ser. No. 451,572
Int. Cl.² B67C *3/26*
U.S. Cl. 141—270 **8 Claims**



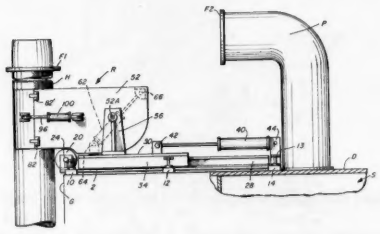
1. A tiltable kettle assembly, comprising;
A. a support stand
B. a kettle
   1. pivotally receivable within said support stand, and
   2. normally disposed therein in an upright position;
C. means for tilting said kettle to a substantially horizongal position, and
D. tray support apparatus including
   1. cam means secured to said support stand
   2. a tray holder for supporting a tray thereon
   3. said tray holder including cam follower means slidably engaged with said cam means for movement of said tray holder relative to said support stand, and
   4. interconnection means pivotally connected between said tray holder and said kettle
      a. whereby tilting movement of said kettle results in sliding movement of said cam follower means on said cam means for moving said tray holder relative to said support stand.

3,921,684

APPARATUS FOR COUPLING OIL LOADING HOSE AND OTHER CONDUIT WITH A STORAGE TANK FILL PIPE

Lawrence P. Allen, Seven Shore Rd., Bourne, Mass. 02532

Filed Dec. 19, 1973, Ser. No. 425,963
Int. Cl.² B65B *3/04*; B67C *3/34*
U.S. Cl. 141—279 **2 Claims**



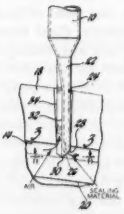
1. A coupling apparatus for receiving and guiding an oil loading hose into connected relationship with a fill pipe which is vertically disposed in the deck of an oil tanker and which is formed with a curved upper extremity having a fill aperture lying in a vertical plane in spaced relation to the deck, said coupling apparatus including a carriage mounted for reciprocating travel toward and away from the fill pipe along the said deck of the oil tanker, hose retaining means mounted in the carriage for locating an end of the said oil loading hose in a position of axial alignment with the said fill aperture, power driving means for moving the said carriage and guiding the axial aligned hose end into abutting relation with the curved upper extremity of the fill pipe, and said hose retaining means comprising a rotatable cradle structure and an adjustable jaw mechanism supported in the rotatable cradle for engaging the oil loading hose when in a vertically disposed position at one side of the tanker, means for closing the jaw mechanism around the said hose and means for rotating the cradle structure and jaw mechanism about a horizontal axis of rotation to locate the end of the hose in said position of axial alignment with the fill pipe.

3,921,685

SEALING MATERIAL INJECTOR NOZZLE

Robert J. Steffes, Windsor, Canada, assignor to General Motors Corporation, Detroit, Mich.

Filed July 24, 1974, Ser. No. 491,336
Int. Cl.² B65B *3/04*
U.S. Cl. 141—310 **1 Claim**



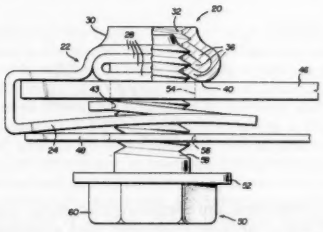
1. An injector nozzle for filling an endless annular sealing space of predetermined cross-sectional area between two parts in an assembly with a sealing material through a cylindrical nozzle receiving hole provided in the assembly that intersects with the endless annular sealing space, said nozzle insertable at one end into the nozzle receiving hole in the assembly, said one end having an outlet that is faceable to direct the

sealing material in one direction into the endless annular sealing space, said one end also having a dam of a configuration and cross-sectional area corresponding to that of the endless annular sealing space that is effective to close off the endless annular sealing space when the outlet is facing in said one direction to prevent the injected sealing material from also being directed in the opposite direction into the endless annular sealing space, and said nozzle having a vent passage in the exterior thereof on the side of said dam opposite said outlet and extending longitudinally of said nozzle outwardly from the endless annular sealing space past the assembly to provide a separate vent passage in said nozzle receiving hole to vent the endless annular sealing space ahead of the sealing material being injected.

3,921,686
LAMINATED NUT AND CLIP

Robert Harvey Markey, Warren, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Filed Aug. 15, 1974, Ser. No. 497,812
Int. Cl.² F16B *39/28*
U.S. Cl. 151—21 C **12 Claims**

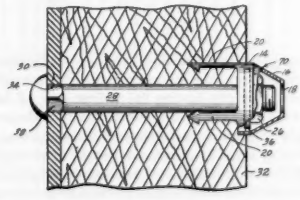


1. A nut formed of a continuous strip of resilient sheet metal, said strip being spirally folded to define four lamina in face to face contact with a strip end retained within the folds of the strip, a barrel portion integrally formed in said laminae having a continuous pilot portion extending from the plane of said laminae and a continuous female threaded bore through said barrel portion, each of said lamina having an integral continuous cone-shaped portion projecting into said barrel portion, said cone-shaped portions nested in face to face contact with the female threaded bore through said cone-shaped portions.

3,921,687
TAMPER-PROOF NUT COVER

Edgar L. Stencel, Huntington Beach, Calif., assignor to VSI Corporation, Pasadena, Calif.

Filed Jan. 28, 1974, Ser. No. 436,965
Int. Cl.² F16B *39/00*
U.S. Cl. 151—41.73 **8 Claims**



1. A nut cover for the prevention of tampering with a nut and bolt combination comprising:

a. a head having a hollow interior for receiving a nut, a smooth, constantly curving exterior surface to present a surface incapable of easily accepting a wrenching tool, and a passage through an axial end of the head for passing the threaded end of the bolt through the cover, the passage having a diameter no greater than the maximum outside diameter of the nut;

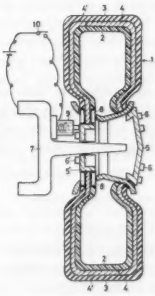
b. a hollow skirt integral with and axial to the head opposite the passage, the hollow interiors of the head and the skirt having diameters greater than the maximum diameter of the nut; and

c. at least two spikes extending axially from the skirt for imbedding in wood and the like to secure the nut cover in place.

3,921,688
SELF-COOLING TIRE

Yasuo Tsuruta, No 22-2, 4-chome, Sanno, Ota, Tokyo, Japan

Filed Sept. 13, 1973, Ser. No. 396,704
Claims priority, application Japan, Apr. 26, 1973, 48-47493
Int. Cl.² B60C *19/06*
U.S. Cl. 152—330 C **10 Claims**



1. For use in a vehicle wheel, a tire having a circular wall portion, and at least two different metals embedded in said wall portion for thermally conducting heat away from the latter, said two different metals engaging each other in said wall portion to form a junction between said metals in said wall portion, support means situated outside of said tire, and electrical circuit means also situated outside of said tire and being carried by said support means and connected to said metals for providing at said junction a cooling of said wall portion due to the Peltier effect.

3,921,689
SAFETY TIRE WITH A SEALING ACTION AND AN ANTI-BURST ACTION

Angelo Caccia, and Vincenzo Benatti, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

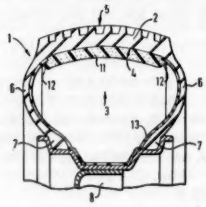
Filed July 25, 1973, Ser. No. 382,363
Claims priority, application United Kingdom, Aug. 1, 1972, 35976/72
Int. Cl.² B60C *17/00*
U.S. Cl. 152—347 **18 Claims**

1. A pneumatic tire having a casing with a tread band, comprising:

an annular band of elastic foam material with prevailingly closed cells, capable of leaning on the internal surface of said casing situated below said tread band, the width of the annular band being at least equal to the width of the tread band of said tire, the thickness of the annular band being no greater than 20 mm and the moment of polar inertia of the annular band measured with respect to the axis of rotation being no greater than one fifth of the moment of inertia of the tire devoid of said band;

a pair of deformable sidewalls for said annular band, each of which is intended to lean substantially on a corre-

sponding sidewall of said casing and has an outer circular edge secured to a corresponding lateral edge of said annular band, and extending upon the side wall of the casing up to a corresponding bead of the tire, so that said annular band and said pair of deformable sidewalls define an inflatable structure;



means capable of preventing the flow of tire inflation air from said inflatable structure in the space between the outer surface of the latter and the corresponding inner surface of the casing below which said structure is situated.

3,921,690

PNEUMATIC TIRES

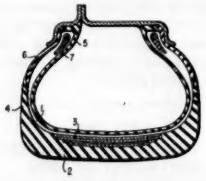
Reginald Harold Edwards, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Nov. 7, 1973, Ser. No. 413,603

Claims priority, application United Kingdom, Nov. 16, 1972, 52909/72

Int. Cl.² B60C *9/02, 15/00, 17/00*

U.S. Cl. 152—354 **8 Claims**



1. A pneumatic tire comprising a tread braced by a breaker assembly, rubber sidewall portions and beads and reinforced by a carcass comprising cords extending substantially radially in at least said sidewall portions and turned up about inextensible bead cores, said tire further comprising an inner lining layer of rubber inside the carcass, each bead being provided with a rubber apex extending radially outwardly from the bead core and a clinch strip adjacent the rim flange contacting area of the bead, said clinch strip and said apex being made of a rubber compound having a hardness of at least 70° B.S. and a resilience of at least 60% measured at 50°C according to B.S. 903 Part A8 Method C - Dunlop Pendulum, and the whole of the inner lining layer and of the sidewall portions extending radially outwardly from the clinch strip to the edge of the tread has a resilience of 85 percent measured at 50°C.

3,921,691

MACROFILAMENTARY YARNS AND RUBBER STRUCTURES REINFORCED THEREWITH

Derek Kenyon, and Donald James Wilson, both of Harrogate, England, assignors to Imperial Chemical Industries, Limited, London, England

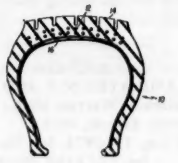
Division of Ser. No. 863,872, Oct. 6, 1969, Pat. No. 3,889,457.

This application June 13, 1973, Ser. No. 369,660

Claims priority, application United Kingdom, Oct. 11, 1968, 48328/68

Int. Cl.² B60C *9/12, 9/18*

U.S. Cl. 152—359 **6 Claims**



1. A rubber structure comprising elastomeric material reinforced with a synthetic filamentary cord embedded therein, said cord comprising a plurality of continuous filaments, each of said filaments having a denier of at least 100 and being individually longitudinally twisted, said individually twisted filaments being further twisted about the other filaments to form a coherent cord of said plurality of filaments.

3,921,692

PNEUMATIC TIRE BREAKER ASSEMBLY

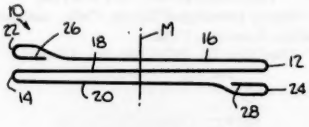
Sami Oyoun, Aachen, Germany, assignor to Uniroyal A.G., Aachen, Germany

Filed Sept. 27, 1974, Ser. No. 509,759

Claims priority, application Germany, Dec. 19, 1973, 2363296

Int. Cl.² B60C *9/18*

U.S. Cl. 152—361 FP **9 Claims**

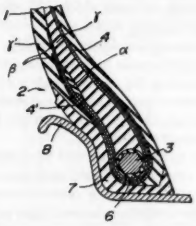


1. A breaker for interposition between the carcass and tread of a pneumatic tire, the breaker being substantially annular and comprising a ply having (a) a first pair of fold regions which divides said ply into a substantially S-shaped array of three axially continuous webs superposed upon one another at least partially, and (b) a second pair of fold regions which further divides said ply into two additional webs axially continuous with said three webs and terminating each in a respective circumferential edge separated and lying in a different circumferential plane from the other, at least one of said two additional webs and its corresponding circumferential edge being interposedly tucked in between and concealed by a selected two of said three webs.

3,921,693
PNEUMATIC TIRE

Yasuo Suzuki, Akigawa; Iwao Arimura, Kodaira, and Akira Matsuda, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 5, 1974, Ser. No. 448,437
Claims priority, application Japan, Mar. 6, 1973, 48-25720
Int. Cl.² B60C *15/06, 9/02*
U.S. Cl. 152—362 R 15 Claims

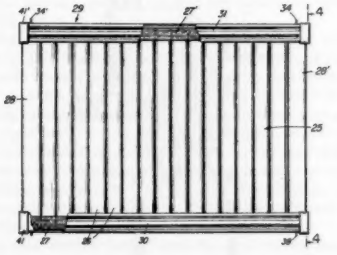


1. A pneumatic tire having a pair of bead portions, sidewalls, a tread and a carcass consisting of at least one reinforcing ply of rubberized metal cords, the ends of said carcass ply being radially outwardly wrapped about bead cores disposed within the bead portions to form turn up portions, each bead portion comprising a hard rubber layer having a Shore A hardness of at least 70 to protect the end of said turn up portion of said carcass ply, at least two reinforcement layers fixed outside of said turn up portion and said hard rubber layer to form a unitary body therewith, and rubber stocks having a Shore A hardness of at least 10 less than that of said hard rubber layer and being arranged on the inside and outside of said unitary body so as to embrace the unitary body between said rubber stocks, thereby preventing separations at the bead portions.

3,921,694
VERTICAL VENETIAN BLINDS

Gerald Galex, 1601 Holly Blvd., Manasquan, N.J. 08736

Filed Apr. 10, 1973, Ser. No. 349,829
Int. Cl.² E06B *9/26*
U.S. Cl. 160—166 A 16 Claims

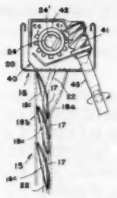


1. A Venetian blind comprising two vertical end rails, a plurality of vertical slats, a horizontal tape provided with transverse ladders connecting said rails at top and bottom thereof, said ladders spacing said slats between said rails, a horizontal lower member and a horizontal upper member, said lower member supporting said blind, and guide means disposed in said upper member for retaining said blind in upright position when being drawn from end to end.

3,921,695
WAND OPERATED VENETIAN BLIND

Victor Debs, 103 St. Marks Place, Staten Island, N.Y. 10301

Filed Sept. 30, 1974, Ser. No. 510,350
Int. Cl.² E06B *9/307*
U.S. Cl. 160—176 2 Claims



1. In connection with a Venetian blind that is closed in either direction, i.e., by tilting the slats in either direction from their horizontal position, the slats being tilted by motion transmitted to them from a gear, the gear being rotated by a worm, and the worm being rotated by a manually rotated wand that is connected to the worm,—the method of protecting the blind against deleterious overpull on the ladders and also preventing retrogressive opening movement of the blind from its closed position regardless of the direction of closure, said method comprising:

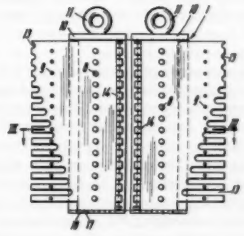
providing the gear with teeth extending over a portion only of the periphery of the gear and permitting the gear, upon continued rotation of the gear in either direction, to rotate out of mesh with the worm and then retrogress a little,

and selecting the number of teeth on the gear, selecting their position on the periphery of the gear, and selecting their circumferential pitch (a) to cause the gear to be on the verge of rotating out of mesh with the worm upon the blind reaching its closed position in either direction and (b) to permit the gear to rotate out of mesh with the worm at a point that is a little beyond the point at which the blind reaches its closed position and which is at least as far beyond such point as the retrogression of the gear upon the gear rotating out of mesh with the worm.

3,921,696
FITTINGS FOR GATHERING AND FIXING CURTAINS OR DRAPES

Hermann Pape, Laggenbeck, Germany, assignor to Gardisette Holding AG, Switzerland

Continuation-in-part of Ser. No. 414,790, Nov. 12, 1973, abandoned. This application May 3, 1974, Ser. No. 466,848
Claims priority, application Germany, Nov. 11, 1972, 22553282
Int. Cl.² A47H *1/00*
U.S. Cl. 160—330 71 Claims



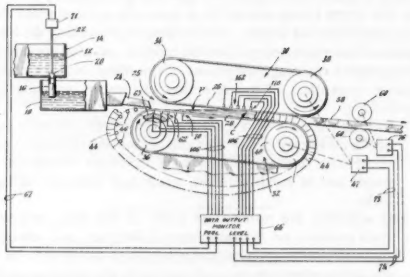
1. An arrangement for gathering and fixing curtain or drape material having, when hung, vertically extending strips spaced from each other comprising one or more threads and addi-

tional threads interconnecting said vertically extending threads, said additional threads hanging slackly and bridging the spacing between said vertically extending strips, said arrangement comprising means attached to the upper end of each vertical strip for locating said strip substantially immovably and means for shortening at least one of said additional threads and for locating said additional threads substantially immovably.

3,921,697
METHOD AND APPARATUS FOR CONTROLLING THE OPERATING CONDITIONS IN CONTINUOUS METAL CASTING MACHINES HAVING A REVOLVING ENDLESS CASTING BELT

Charles J. Petry, Winooski, Vt., assignor to Hazelett Strip-Casting Corporation, Winooski, Vt.

Division of Ser. No. 343,884, March 22, 1973, Pat. No. 3,864,973. This application Aug. 5, 1974, Ser. No. 494,702
Int. Cl.² B22D *11/16*
U.S. Cl. 164—4 **7 Claims**



1. The method of controlling a continuous metal casting machine of the type having at least one endless, flexible, revolving casting belt with a casting surface which engages the molten metal to be cast and a reverse, cooled surface along which is directed a substantially continuous high velocity flow of liquid coolant, the casting surface being covered with a belt coating to insulate and protect the belt from the molten metal and to control the rate of cooling of the molten metal, said method comprising:

predetermining the desired range in operation of the position of the molten metal pool in the input region of the casting machine;

positioning a series of at least two heat sensing detectors in bearing contact with the moving reverse, cooled surface of the casting belt and in upstream-downstream spaced relation with respect to the direction of travel of the belt in respective positions to span the desired predetermined range in pool position;

arranging said detectors to present minimal interference to the continuous high velocity flow of liquid coolant directed along the reverse, cooled belt surface;

insulating said heat sensing detectors from the high velocity flow of coolant rushing by them;

monitoring the responses of said detectors to changes in the temperature of the moving reverse cooled surface of the belt at the respective upstream-downstream positions of said detectors to determine the position of the molten metal pool; and

maintaining the rate of infeed of the molten metal matched to the speed of the machine to keep the pool position within said desired predetermined range in operation.

6. Apparatus for controlling the operating conditions in a continuous metal casting machine of the type having at least one endless flexible revolving casting belt with a casting surface which engages the molten metal to be cast in a casting region as confined by the belt, said belt having a reverse, liquid-cooled surface along which is directed a substantially continuous high velocity flow of liquid coolant, and the casting surface of said belt being covered with a belt coating to insulate and protect the belt from the molten metal and to control the rate of cooling of the molten metal, said apparatus comprising;

support means attached to the continuous metal casting machine near the casting region;

a series of at least two heat sensing detectors mounted on said support means and located at spaced positions near said casting region;

said support means holding detectors in bearing contact with the moving reverse, cooled surface of said casting belt near said casting region;

said detectors being arranged to present minimal interference to the continuous high velocity flow of liquid coolant directed along the reverse belt surface;

thermal insulation material associated with said heat sensing detectors for insulating them from the high velocity flow of liquid coolant rushing by;

monitor means connected to said heat sensing detectors to monitor the responses of said detectors to changes in the temperature of the moving reverse surface of the belt at the respective upstream-downstream positions thereof to determine the molten metal pool position;

said series of heat sensing detectors being located in relative upstream and downstream positions in relation to travel of the casting belt near the input to said casting region to span the desired location of the molten metal pool position;

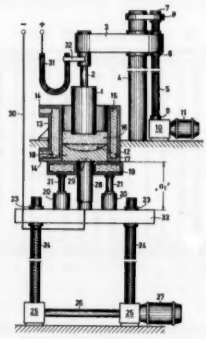
control means for controlling the rate of infeed of molten metal into the input region of the machine; and

circuit means interconnecting said monitor means and said control means for automatically controlling the rate of infeed of the molten metal to keep the position of the molten pool within the desired operating range.

3,921,698
METHOD FOR THE PRODUCTION OF METALLIC INGOTS

Helmut Theodor Grof; Heinrich Fritz Sonntag, both of Bruchkobel; Helmut Scheidig, Rossdorf, and Anton Wamser, Hanau am Main, all of Germany, assignors to Leybold-Heraeus-Verwaltung G.m.b.H., Cologne, Germany

Filed Aug. 31, 1972, Ser. No. 285,315
Claims priority, application Germany, Aug. 31, 1971, 2143445
Int. Cl. B22d *27/02*
U.S. Cl. 164—52 **3 Claims**



1. A method for producing a metallic ingot comprising the steps of: passing melted material into a liquid-cooled chill mold, said mold having a liquid-cooled bottom movable from the walls of said mold; solidifying said material through crystallization directed upward from the bottom to produce an

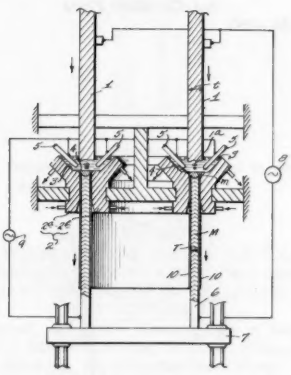
ingot; and separating the bottom of said mold from the bottom of said ingot over at least a period of time, so that heat flow from said ingot is substantially reduced after solidification of a lower portion of said ingot.

3,921,699

METHOD OF AND APPARATUS FOR PRODUCING METALLIC ARTICLES BY ELECTROSLAG MELTING

Akira Ujile, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 27, 1973, Ser. No. 383,057
Claims priority, application Japan, Aug. 28, 1972, 47-85294
Int. Cl.[2] B22D *27/02*
U.S. Cl. 164—52 **13 Claims**



1. In an electroslag melting method for producing a metallic article using a liquid cooled metal mould with inner and outer spaced parts and upper, central and lower sections with the facing sides of the central sections being parallel spaced the thickness of said article and that spacing being of the same cross-sectional shape as that of said metallic article, and with at least one of said upper sections having its inner side sloping outwardly away from the other side a significant angle relative to the vertical to form a slag receiving trough with a bottom well atop the open upper end of the space between said central parallel sections, the improvement comprising the steps of:

inserting a start piece upwardly into the space between the central parallel sections to close the said upper open end of said space,

disposing at least one non-consumable electrode substantially at said angle into said trough adjacent at least said one side thereof and deeply thereinto so that the bottom end of each said electrode is adjacent the said well,

disposing molten slag into said trough to form a slag bath,

feeding at least one consumable electrode continuously at a predetermined rate of speed deeply into said slag bath to cause electroslag melting of the lower end of said consumable electrode with the resultant droplets of molten metal successively falling in the slag bath and accumulating in a molten metal pool in said well,

heating said molten metal pool by said non-consumable electrode to cause bonding of molten metal from said pool to the top end face of said start piece and to cause a substantially uniform temperature distribution in said slag bath to reduce the cooling rate of the molten metal pool which would otherwise be more quickly cooled by said liquid cooled mould and therefore less rapidly movable downwardly from said well through said space between said central parallel sections,

withdrawing said start piece downwardly through the said space between said parallel central sections of said mould to cause molten metal from said heated pool to move continuously downward therewith at the same rate of speed which is greater than if said molten metal pool heating had not occurred, and

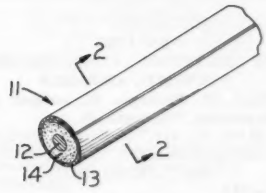
cooling said molten metal and successively solidifying same as it moves downwardly between said central parallel sections for producing at the lower section of said mould a continuous solidified metallic article with reduced growth of dendritical structure and with a smaller grain size due to said pool heating.

3,921,700

COMPOSITE METAL ARTICLE CONTAINING ADDITIVE AGENTS AND METHOD OF ADDING SAME TO MOLTEN METAL

John G. Frantzreb, Sr., Peoria, and John R. Nieman, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 15, 1974, Ser. No. 488,755
Int. Cl.[2] B22D *27/20*
U.S. Cl. 164—57 **12 Claims**



1. A method of adding a relatively volatile metallic agent to molten ferrous metal comprising the steps of continuously feeding a composite wire-like structure containing said agent at a controlled rate sufficient to provide a desired amount of said agent within the molten ferrous metal, said composite wire-like structure comprising an inner core containing said relatively volatile metallic agent, an outer sheath of ferrous metal substantially concentrically disposed to said core, and a particulate insulating material having a melting or subliming point generally at least about equal to the melting point of said outer sheath disposed between said core and said sheath, said insulating material providing a heat barrier sufficient to protect said inner core from delivery prior to the melting of said outer sheath of ferrous metal.

3,921,701

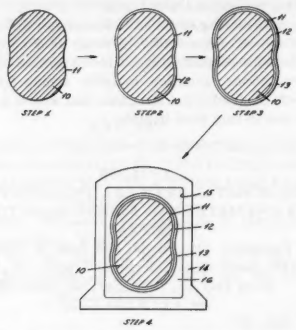
METHOD FOR IMPROVING BOND BETWEEN TRANSPLANTED COATING AND DIE-CASTING

Leonard G. Cordone, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 20, 1973, Ser. No. 390,134
Int. Cl.[2] B22D *19/02*
U.S. Cl. 164—98 **4 Claims**

1. A process for uniting an electrolytically deposited cermet with a die-cast metal, said cermet being comprised of a material selected from the group consisting of titanium carbide, tungsten carbide and aluminum oxide, said die-cast metal being selected from the group consisting of aluminum, iron and magnesium, the process consisting of electroplating said cermet in a thickness range of 0.010–0.040 inches, and having a controlled surface roughness at one side, said cermet being electrolytically deposited with a current density above 400 amps/ft^2 during a substantial portion of the time of said deposition, and electroplating a uniform deposit of a copper-base constituent onto said one side of said cermet in a thickness range of 0.0005–0.002 inches to form an electrolytic-metallurgical bonded assembly, and subsequently die-casting said

molten metal about said assembly whereby the heat of said molten metal is effective to create an alloy metallurgical bond



between said copper-base constituent and the roughness of said constituent creates a mechanical lock therebetween.

3,921,702

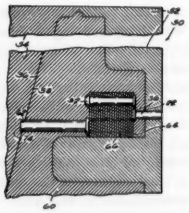
METHOD OF DIECASTING A COMBINED SHEAVE AND FLYWHEEL ASSEMBLY

Harry M. Ward, III, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 319,775, Dec. 29, 1972, Pat. No. 3,782,212. This application Oct. 1, 1973, Ser. No. 402,324

Int. Cl.² B22D *19/00*

U.S. Cl. 164—112 **6 Claims**



6. A method of die casting a member utilizing a casting die including first and second separable die sections which, when moved relative to each other to a casting position, cooperate to define at least a portion of a die cavity corresponding to the desired configuration of the member, and wherein the first die section includes means for locating, at a predetermined location within the die cavity, a component located wholly within the die cavity and occupying a portion thereof so as to be cast in place integrally with the member, wherein the second die section includes an inner face which defines a portion of the die cavity forming the die cast member with an outer surface which is non-recessed, wherein the component includes a projection extending through the die cavity towards the second die section and having an outer end portion adapted to removably engage the inner face of the second die section when the component is located at the predetermined location and the first and second die sections are in the casting position, said method comprising the steps of installing the component on the locating means, moving the die sections to the casting position to form the die cavity independently of the component and to removably engage the outer end portion of the projection with the inner face of the second die section so as, in cooperation with the locating means, to restrain movement of the component within the die cavity and so as, upon filling of the die cavity with molten metal, to cast the outer surface of the member without a recess therein, filling the unoccupied portion of the die cavity with a molten metal, and cooling the molten metal to form the member with the component including the projection becoming a non-removable part of the thus formed member.

3,921,703

WATER-COOLED SLIDING MOLD FOR ELECTRO SLAG REMELTING

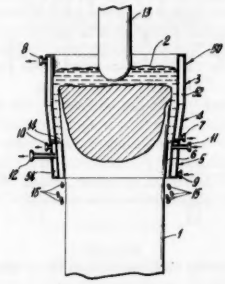
Ludwig Eugen Rohde, Essen, and Erich Zimmermann, Hattingen, both of Germany, assignors to Rheinstahl Huettenwerke AG, Germany

Filed June 7, 1973, Ser. No. 367,792

Claims priority, application Germany, June 15, 1972, 2229197

Int. Cl.² B22G *27/02*

U.S. Cl. 164—252 **8 Claims**



1. A water-cooled sliding mold for the electroslag remelting of a billet of relatively large cross section using a slag layer which covers the billet, comprising a tubular mold having an upper part with a substantially constant smooth cross section, a middle part having a substantially smooth downwardly diminishing cross section, and a lower part having an irregular cross section which includes inwardly extending portions at spaced locations around the interior circumference which extend inwardly below the smallest cross section of said middle part.

3,921,704

OXIDATION-FREE CASTING APPARATUS FOR CONTINUOUS CASTING

Yasuyuki Tozaki, Kashima, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Nov. 11, 1974, Ser. No. 522,948

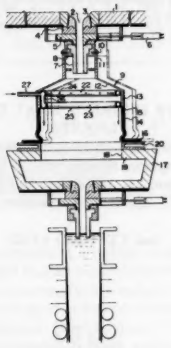
Claims priority, application Japan, Nov. 12, 1973, 48-129843[U]

Int. Cl.² B22D *37/00*

U.S. Cl. 164—259 **9 Claims**

1. In combination with an oxidation-free casting apparatus for continuous casting having a ladle provided with a sliding gate, the improvement comprising a steel hood mounted on a nozzle holder secured to the sliding gate, a skirt depending from the lower end of said hood, and an inert gas jet means consisting of at least one inert gas jet tube being disposed along the inner wall of said hood and having jet holes for

spraying inert gas in directions substantially perpendicular and parallel to the longitudinal axis of said hood said skirt having



a free end contoured so as to be adapted to surround the opening of a tundish.

3,921,705

AUTOMATED DEVICE FOR TAKING OUT SLABS FROM A CONTINUOUS CASTING APPARATUS, BRINGING THEM INTO ALIGNMENT AND STACKING THEM TOGETHER

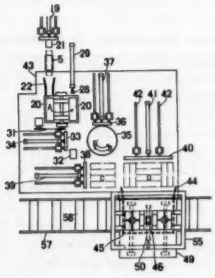
Takashi Furuse, and Sachio Kamata, both of Akita, Japan, assignors to The Dowa Mining Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1974, Ser. No. 437,943

Claims priority, application Japan, Feb. 6, 1973, 48-14239; Feb. 8, 1973, 48-15172; Feb. 9, 1973, 48-15699; Feb. 12, 1973, 48-16503

Int. Cl.² B22D *5/04*

U.S. Cl. 164—269 **7 Claims**



1. A slab transposal and stacking mechanism, particularly suitable for use with continuous casting apparatus which includes a conveyer having molds thereon, said mechanism comprising means for ejecting castings from said molds, an inverting device for inverting the position of castings received therein, first transfer means for receiving said ejected castings from said molds and for transferring said castings to said inverting device, alignment means adapted to have said castings placed thereupon, said alignment means being rotatable to effect a desired orientation of castings placed thereupon, second transfer means for transferring said inverted castings from said inverting device to said alignment means, a grouping station for receiving said castings, third transfer means for transferring said castings from said alignment means to said grouping station to form said castings into a group with said castings arranged in a predetermined orientation, a stacking device for receiving formed groups of castings from said grouping station and for forming said groups into a stack, and fourth transfer means for transferring formed groups of said castings from said grouping station to said stacking device.

3,921,706

STARTER BAR FOR USE IN CONTINUOUS CASTING PLANTS

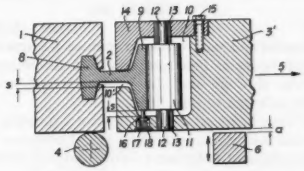
Horst Wiesinger, and Gunter Holleis, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Sept. 26, 1974, Ser. No. 509,649

Claims priority, application Austria, Oct. 19, 1973, 8872/73

Int. Cl.² B22D *11/08*

U.S. Cl. 164—274 **6 Claims**



6. A starter bar for use in a continuous casting plant having rollers for transporting a casting, comprising:

a starter bar body;

a starter bar head attached to one end of said starter bar body, said starter bar head having a slit in it that runs horizontally and transverse to the longitudinal dimension of said starter bar body, the slit in said starter bar head opening into a wider recess in said starter bar head;

a coupling for connecting the casting with said starter bar head, said coupling having one end adapted to be fused in the casting and the other end detachably connectable with said starter bar head, said other end of said coupling being horizontally insertable into the slit and recess of said starter bar head;

starter bar rollers arranged vertically in the recess of said starter bar head for supporting said coupling with play in the slit;

a stop in the starter bar head on one side of the coupling for restraining movement of the coupling in one direction;

a detachable and swivable holding plate in the starter bar head on the other side of the coupling for restraining movement of the coupling in the other direction; and

a spring for pressing the plate against the coupling to secure the coupling in its position.

3,921,707

MEANS FOR FORMING METAL PARTS

Leonard H. Killion, P.O. Box 608, Derby 67037, and E. J. Blair, 9010 Wornall Rd. 67061, Kansas City, both of Kans.

Division of Ser. No. 150,467, June 7, 1971, Pat. No. 3,802,483. This application Mar. 11, 1974, Ser. No. 449,912

Int. Cl.³ B22D *17/12*

U.S. Cl. 164—305 **4 Claims**

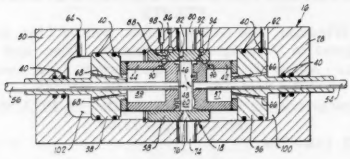
1. Apparatus for forming metal parts comprising:

a. a separable die housing means containing a separable die means having a piston member having in an end portion a die block member having an especially shaped die face,

b. means to separate and connect said die housing means and said die means,

c. means to fill said die means with molten metal having a vacuum pressure filling means having a passageway into said die means for the molten metal to pass and a passageway from said die means to remove by vacuum pressure air entrapped in said die means when in a closed position,

d. means to exert forging pressure to form the molten metal in said die means,
e. means to heat and cool said die means, and
f. means to remove a formed part from said die means,
g. said means to separate and connect said die housing means and said die means is a die press means having means to separately move said die housing means, said



die means and said means to remove a formed part, and
h. said means to heat and cool said die means in a passageway through said die housing means and said die means adapted to pass fluid,

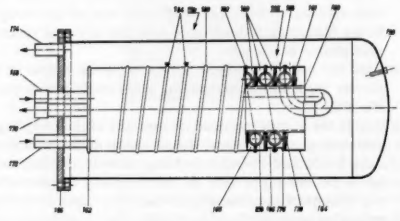
said die means being adapted to receive a quantity of molten metal in said die means, form same under pressure, cool same simultaneously and hold same until solidified then open for removal of the formed part.

3,921,708

HEAT EXCHANGER AND METHOD OF OPERATION THEREOF

Lothar P. Brenner, Lucerne, Switzerland, assignor to Ygnis S.A., Fribourg, Switzerland

Continuation-in-part of Ser. No. 78,688, Oct. 7, 1970, abandoned. This application June 21, 1973, Ser. No. 371,969
Claims priority, application Switzerland, Apr. 30, 1973, 6116/73
Int. Cl. F28f *19/00*
U.S. Cl. 165—84 **9 Claims**



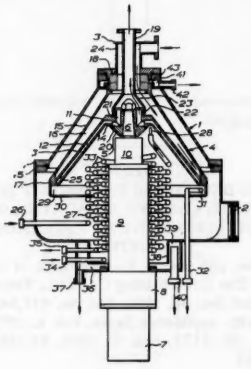
1. A heat exchanger for transferring heat between a medium inside an element and a medium outside the element comprising:
a heat exchange element in the form of a tube whose inner and outer surfaces have the form of corrugations, said tube having a wall thickness thin enough to allow flexibility of the tube upon the occurrence of pressure differentials in either medium; and
supporting means for limiting the freedom of movement in all directions and for allowing deformation of the tube to an extent sufficient to permit cleaning of the surfaces of the flexible tube upon the occurrence of pressure differentials in either medium, said supporting means only allowing deformation of said tube within the elastic range of the tube material;
wherein said supporting means comprises:
an outer cylinder;
an inner cylinder;
a helical rib connected between said outer cylinder and said inner cylinder to form a helical passageway therewith, wherein said heat exchange element passes through, said passageway; and
spacing elements connected to said rib and said outer cylinder for limiting the degree of freedom of movement of the heat exchange element.

3,921,709

APPARATUS FOR INDIRECT HEAT TREATMENT OF LIQUIDS

Vaclav Feres, Karlsruhe, Germany, assignor to Liquid Processing AB, Loddekopinge, Sweden

Filed Jan. 15, 1974, Ser. No. 433,613
Claims priority, application Sweden, Jan. 17, 1973, 7300609
Int. Cl.² F28D *11/02*
U.S. Cl. 165—88 **15 Claims**



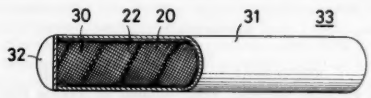
1. An apparatus for indirect heat treatment of a liquid comprising a vacuum-tight casing, a substantially frusto-conical rotor body mounted for rotation in said casing, said rotor including a central supporting hub means, a frusto-conical supporting partition wall, a frusto-conical outer wall, and a substantially frusto-conical inner wall constituting an inner rotation-symmetrical heat exchange surface on said rotor body, said partition wall being connected at its narrow end to said hub means, said outer wall being connected at its narrow end in a rotary and fluid-tight manner to said vacuum-tight casing and said inner wall being connected at its narrow end in a fluid-tight manner to said central hub means, said partition, said outer and said inner walls being interconnected at their wider ends, and said inner wall and said partition, and said partition and said outer wall being spaced apart to form gaps therebetween permitting flow of heat carrier fluid therethrough, apertures in said partition wall interconnecting the gaps on each side of said partition wall at least at their outer ends near the wider end of said rotor body, said hub means having at least one channel which opens into the gap between said inner and said partition wall means to permit flow of the heat-carrier fluid therethrough, a drive shaft supported with one end cantilevered into said vacuum-tight casing and supporting said rotor body for rotation therewith, motor means connected to the other end of said shaft for rotating said shaft and said rotor body, a connecting header mounted on said vacuum-tight casing and having inlet and outlet conduits for the heat-carrier fluid, said inlet and outlet conduits being connected to said gaps in said rotor body, inlet means arranged to direct the liquid to be treated into said vacuum-tight chamber and onto the exposed surface of said inner wall near its narrow end, and outlet means for the heat treated liquid.

3,921,710

HEAT PIPE AND MANUFACTURING METHOD THEREOF

Masayoshi Katayama, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Aug. 22, 1973, Ser. No. 390,419
Claims priority, application Japan, Aug. 23, 1972, 47-84430
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 7 Claims



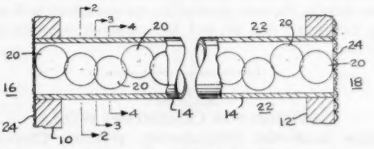
1. A heat pipe comprising a hollow wick impregnated with a liquid heat medium and an outer tubular cylinder accommodating said wick in a hermetically sealed condition, said wick including a ribbon-shaped material wound in the form of a helix, mutually adjacent lateral edges of said wick material being disposed in intimate contact with each other, without overlapping or separating, and bound with each other by hem stitching.

3,921,711

TURBULATOR

Adrian J. Westbrock, Birmingham, Ala., assignor to American Standard, Inc., New York, N.Y.

Continuation of Ser. No. 257,501, May 30, 1972, abandoned.
This application Mar. 20, 1974, Ser. No. 453,112
Int. Cl.[2] F28F *13/08, 13/12*
U.S. Cl. 165—109 1 Claim



1. A heat exchanger for rapidly conducting heat between a first fluid and a second fluid comprising:

a thermally conductive tubular cylindrical member having a fluid entrant opening at one end and a fluid discharge opening at the other end thereof;

means for a continuous and uninterrupted flow of the first fluid through said tube;

turbulator means disposed within the tubular member for continuous turbulent mixing of the first fluid when the first fluid is being conducted through the heat exchanger from the entrant opening to the discharge opening of the tubular member;

said turbulator means comprising a plurality of spherically formed members being randomly disposed within the tubular member and in which each spherical member is in point to point contact between two adjacent spherical members and in point contact with the inner surface of the tubular member to thereby provide three point contact;

said spherical members having a diameter greater than the internal radius of the tubular member and less than the diameter of the tubular member;

said spherical members being positioned along a three-dimensional curve formed by the centroid of each member, the axis of which coincides with the axis of the tubular member, said spherical members being offset from each other by approximately 120 radial degrees measured about the axis of the tubular member and the three-dimensional curve; and

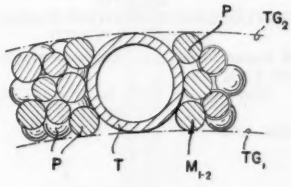
said spherical members forming a path which causes the first fluid to flow around and between the spherical members so that said first fluid substantially contacts the entire inner surface of the tubular member to provide a scrubbing action on the tube walls and when a second fluid is caused to flow around the outer surface of the tubular member heat is rapidly dissipated through the tube wall so that a heat exchange is accomplished between said first and second fluid.

3,921,712

HEAT EXCHANGER STRUCTURE FOR A COMPACT BOILER AND THE LIKE

Peter N. Renzi, Basking Ridge, N.J., assignor to American Standard, Inc., New York, N.Y.

Continuation of Ser. No. 16,202, March 2, 1970. This application Dec. 8, 1971, Ser. No. 208,036
Int. Cl. F28f *1/22*
U.S. Cl. 165—165 11 Claims



1. A heat exchanger for transferring heat between a first fluid and a second fluid comprising a conduit network through which a first fluid is transmitted, a matrix of discrete conductive bodies which contact each other, said matrix being randomly dispersed between adjacent conduits forming said conduit network and contacting only part of the outer adjacent surfaces of said conduits forming said network, the bodies of said matrix providing tortuous light-transparent spacial paths therebetween through which a second fluid may pass, said matrices having plural layers of said conductive bodies and being arranged in the direction of the flow of said second fluid, and said second fluid being applied directly against the outer wall of said conduit network and being indirectly applied against said outer wall through the spacial paths between the bodies of said matrix.

3,921,713

HEAT EXCHANGER

Emanuel Schnitzer; Thomas M. Grubbs, Sr., both of Houston, and Kornel Nagy, Channelview, all of Tex., assignors to H. B. Zachry Co., San Antonio, Tex.

Filed Dec. 26, 1973, Ser. No. 427,794
Int. Cl. F28g *3/00*
U.S. Cl. 165—167 9 Claims

1. A heat exchanger which comprises:

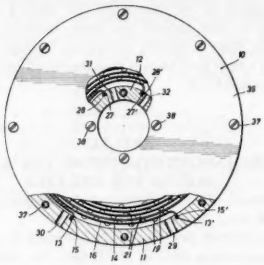
an outer retaining and fluid distribution ring,

at least one pair of alternating smooth and dimpled thin, thermally conductive strips wound in a spiral which are attached to said outer fluid distribution ring at different points, said dimpled strip having dimples extending substantially outwardly from the plane of said dimpled strip from each side of said strip,

an inner retaining and fluid distribution ring to which said strips are attached at spaced points, and

means for sealing and insulating the side edge of said strips in a fluid tight manner thereby forming at least two closed

passageways between said thermally conductive strips in spiral pathways between said outer retaining and fluid

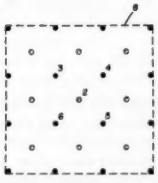


distribution ring and said inner retaining and fluid distribution ring.

3,921,714
WATERFLOODING EMPLOYING SURFACTANTS PRODUCED IN SITU

William R. Foster, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,801
Int. Cl.² E21B *43/22*
U.S. Cl. 166—270 **8 Claims**



1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

a. introducing into said reservoir via said injection system an amount of at least 0.03 pore volume of an aqueous solution of an alkaline agent and an alkali metal fluoride whereby calcium soaps within said reservoir are converted to monovalent metal soaps,

b. thereafter introducing into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and

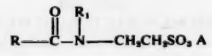
c. recovering oil from said production system.

3,921,715
SECONDARY RECOVERY METHOD

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,986
Int. Cl.² E21B *43/27, 43/22*
U.S. Cl. 166—271 **17 Claims**

1. A method for the recovery of hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation an aqueous acidic solution of 0.5 to 28 percent by weight of a non-oxidizing mineral acid and from about 0.005 to about 2 percent by weight of a compound therein, and recovering hydrocarbons through the production well, said compound being a water-soluble substituted taurine having the following general formula:



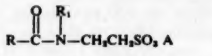
wherein R and R_1 are aliphatic hydrocarbon groups, including the corresponding unsaturated aliphatic hydrocarbons, mixtures and isomers, each group containing from 1 to 20 carbon atoms therein, the sum total of the carbon atoms in R and R_1 being between 9 and 30, and A is an alkali metal or ammonium ion.

3,921,716
SECONDARY RECOVERY METHOD

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,969
Int. Cl.² E21B *43/27, 43/26*
U.S. Cl. 166—271 **14 Claims**

1. A method for the recovery of hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation a composition comprising an aqueous acidic solution containing from about 0.01 to about 5% by weight of carbon dioxide and from about 0.005 to about 2% by weight of a compound therein, said compound being a water-soluble substituted taurine having the following general formula:



wherein R and R_1 are aliphatic hydrocarbon groups, including the corresponding unsaturated aliphatic hydrocarbons, mixtures and isomers, each group containing from 1 to 20 carbon atoms therein, the sum total of the carbon atoms in R and R_1 being between 9 and 30, and A is an alkali metal or ammonium ion.

3,921,717
METHOD FOR CEMENTING WELLS

Solomon Isaakovich Danjushevsky, ploschad Chernyshevskogo, 7, kv. 79; Rakhil Izrailevna Liogonkaya, Novo-Izmailovsky prospekt, 53, kv. 10, and Lev Girshovich Sudakas, ulitsa Sheigunova, 15, kv. 6, all of Leningrad, U.S.S.R.

Division of Ser. No. 378,638, July 12, 1973. This application Jan. 23, 1975, Ser. No. 543,517
Int. Cl.² E21B *33/14*; C04B *7/16, 9/00*
U.S. Cl. 166—292 **2 Claims**

1. In a method for cementing wells with an aqueous binder at a temperature of 100°–200°C and under a pressure not exceeding 1000 atm, the improvement comprising pumping into the well an aqueous suspension of a binder consisting essentially of blast-furnace slag and between 5 and 10 weight percent of magnesium oxide having a refractive index between 1.722 and 1.734.

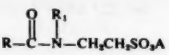
3,921,718
METHOD FOR STIMULATING WELL PRODUCTION

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,984
Int. Cl.² E21B *43/27, 43/26*
U.S. Cl. 166—307 **16 Claims**

1. A method of increasing the production of fluids from a subterranean fluid-bearing formation having present therein acid-soluble components comprising injecting down the well bore penetrating said formation and injecting therefrom into said formation under a pressure greater than the formation pressure, an aqueous acidic solution containing from about 0.5 to about 28 percent by weight of a mineral acid having a

compound therein in an amount of from about 0.005 to about 2 percent by weight, said compound being a water-soluble substituted taurine having the following general formula:



wherein R and R_1 are aliphatic hydrocarbon groups, including the corresponding unsaturated aliphatic hydrocarbons, mixtures and isomers, each group containing from 1 to 20 carbon atoms therein, the sum total of the carbon atoms in R and R_1 being between 9 and 30, and A is an alkali metal or ammonium ion, maintaining said solution in contact with the formation and production equipment for a time sufficient for the acid to chemically react with the acid-soluble components of the formation to etch passageways therethrough thereby increasing substantially the flow capacity of the said subterranean formation.

3,921,719

WELL DRILLING AND PRECOMPLETION METHOD

Robert W. McCollum, Allen, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 18, 1974, Ser. No. 533,763
Int. Cl.² E21B *23/02, 33/10, 43/00*
U.S. Cl. 166—315 **15 Claims**

1. A method of drilling and precompleting a well bore comprising the steps of: drilling a first upper portion of said well bore; drilling a second lower portion of said well bore; pressure isolating said lower portion of said well bore; opening said upper portion of said well bore to the atmosphere; inserting a string of slotted liner in said upper portion of said well bore; closing said upper portion of said well bore above said string of slotted liner; opening said lower portion of said well bore into said upper portion of said well bore to equalize the pressures between said portions of said well bore; and setting said string of slotted liner in said lower portion of said well bore.

3,921,720

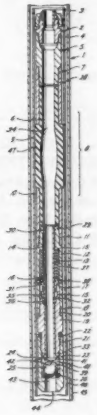
HYDRAULIC PACKER APPARATUS AND METHOD

Rodney J. Wetzel, St. Martinville, La., assignor to Hydraulic Workover, Inc., Lafayette, La.

Filed July 24, 1974, Ser. No. 491,224
Int. Cl.² E21B *33/127*
U.S. Cl. 166—315 **21 Claims**

1. An hydraulically resettable packer apparatus comprising:
a. Hydraulically inflatable packing means for sealable engagement in a well bore; and
b. Valve means retaining pressure within the apparatus during inflation of the packing means, said valve means releasing pressure greater than the pressure maintaining the packing means in sealable engagement, said valve means further resisting exit of fluid through said valve means and below said packing means upon retraction of the packing means.

5. A method of setting and releasing a hydraulically resettable packer in a well having a wall wherein the packer is provided with an inflatable packing means and valve means for retaining pressure within the apparatus during inflation of the packing means and for release of pressure greater than the pressure maintaining the packing means in sealable engagement with the wall, said valve means being in position to resist exit of fluid through the valve means upon retraction of the packing means, comprising the steps of:
a. Positioning the packer in the well at a predetermined location;



b. Injecting fluid pressure into the packer to inflate the packing means to sealing engagement with the wall;
c. Increasing fluid pressure in excess of the amount required to fully inflate the packing means, such that the valve means is urged openly by the increased fluid pressure and fluid travels through and out of the apparatus below the packing means while the packing means remains sealingly engaged with the wall; and
d. Reducing fluid pressure to less than the amount required to fully inflate the packing means such that the packing means becomes disengaged from the wall and the valve means is closed.

3,921,721

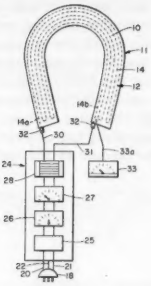
PLASTIC HORSE SHOE AND METHOD OF ATTACHMENT

Albert J. George, 1684 Sutter Ave., Simi Valley, Calif. 93065

Filed Aug. 23, 1974, Ser. No. 500,063
Int. Cl.² A01L *3/00*
U.S. Cl. 168—4 **19 Claims**

1. A horseshoe for attachment to the hoof of a horse;
said horseshoe being fabricated of a flexible material having wearing resistance properties;
an adhesive bond between the upper surface of said horseshoe and the lower surface of the horse's hoof;
a flexible formed heat source entirely embedded within said horseshoe for producing a substantially uniform adhesive curing temperature over said upper surface when connected to an energy source; and
said formed heating source comprising a resistance heating

wire completely embedded within said horseshoe in a wire pattern producing said uniform curing temperature

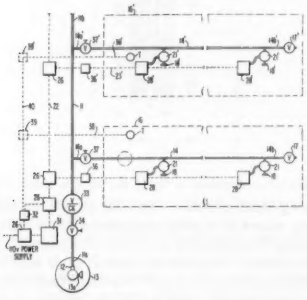


when the ends of said wire are connected to a source of electrical energy.

3,921,722
FLUID DISTRIBUTION SYSTEM

Grady W. Query, 3534 Central Ave., Charlotte, N.C. 28205

Continuation-in-part of Ser. No. 373,879, June 26, 1973, abandoned. This application Mar. 27, 1974, Ser. No. 455,080
Int. Cl.[2] A62C *35/00*
U.S. Cl. 169—9 **11 Claims**



1. A distribution system for a combination of liquid and gas comprising:

a. a main conduit through which said combination may flow;

b. a plurality of branch conduits through which said combination may flow connected to said main conduit at one end and closed at the other end;

c. a plurality of spray nozzles connected on each of said plurality of branch conduits;

d. a plurality of valve means, one on each of said plurality of spray nozzles, operable to control flow of said combination through each of said plurality of spray nozzles;

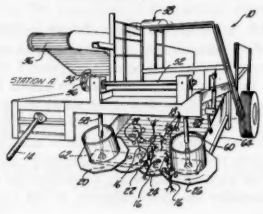
e. flow control means for introducing said combination of a liquid and a gas into said main conduit and thereby to said plurality of branch conduits including a supply source, and for maintaining said combination of a liquid and a gas in similar proportions in said main conduit and said plurality of branch conduits as it is in said supply source; and

f. condition responsive means operative to respond to a pre-determined condition by opening a pre-determined number of said plurality of valve means thereby allowing flow of said combination of liquid and gas through a pre-determined number of said plurality of spray nozzles.

3,921,723
HARVESTING MACHINE

David M. Seem, R.D. 2, Kutztown, Pa. 19530

Filed May 2, 1974, Ser. No. 466,152
Int. Cl.[2] A01D *17/04*
U.S. Cl. 171—14 **4 Claims**

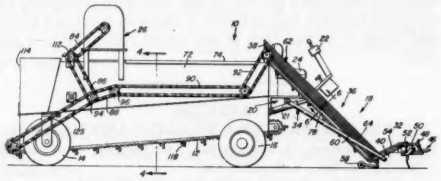


3. In combination with a harvesting machine for removing plants with fruit thereon from a field and subsequently separating the fruit from the plants as said harvesting machine moves along said field, at least four cutter discs including two outer discs and two inner discs disposed forwardly of said harvesting machine for severing said plants with fruit from a field, a movable conveyer belt for receiving the plants with fruit severed by said cutter discs, said movable conveyer belt being dimensioned in width to extend beyond said two inner discs to the centers of said outer discs, said cutter discs being aligned with respect to each other in a direction perpendicular to the direction of motion of said harvesting machine, means for rotating said outer discs in opposite directions with respect to each other with the directions of rotations being towards the center of and in the general direction of the movement of said conveyer belt, means for rotating said inner discs in opposite directions with respect to each other with the directions of rotations being towards the center of said conveyer belt whereby plants with fruit in a field are severed by said cutter discs along the width of said aligned cutter discs with the rotations of said cutter discs causing the severed plants with fruit to be spread along the width of said conveyer belt.

3,921,724
HARVESTER WITH DIGGING HEAD AND ROOT CROP WASHER

James F. Horton, Sr., 1407 Anderson St.; Thomas J. Horton, 404 Albert Ave., and James F. Horton, Jr., 1512 Forest Hill, all of Wilson, N.C. 27893

Filed July 31, 1973, Ser. No. 384,364
Int. Cl.[2] A01D *29/00*
U.S. Cl. 171—117 **9 Claims**



1. A machine for harvesting ground crops, comprising a mobile frame adapted to be propelled above the ground, an extensible chute hingedly suspended from the frame and extending forwardly therefrom, crop pick-up means connected to the chute for support thereof above the ground and delivery of a crop thereto, thrust transmitting means connecting the frame to the pick-up means independently of the chute for forward displacement of the pick-up means through the soil, separator means mounted on the frame for separating soil from the crop, conveyor means mounted in the chute for

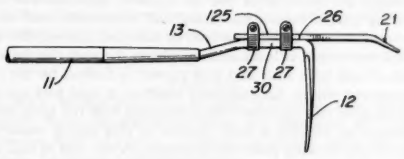
displacing the soil and the crop from the pick-up means to the separator means, means for collecting the crop separated from the soil and means for discharging the soil separated from the crop rearwardly of the frame.

3,921,725

COMBINATION TOOL FOR HUSBANDRY PURPOSES

John Trutor, Benson, Vt. 05731, and Karl F. Kovacs, 5110 New Perry Highway, Erie, Pa. 16509

Filed Dec. 13, 1973, Ser. No. 426,715
Int. Cl.² A01B 1/04, 1/20, 1/22; A01D 9/02
U.S. Cl. 172—375 2 Claims



1. A combination tool for use in husbandry comprising a hoe and a plurality of removably mounted parallel tines,

said hoe having a platelike blade,

a cross member mounting said tines,

said tines having one end integrally fixed to said cross member and extending generally perpendicular to said cross member,

said cross member including a base member having one end integrally fixed to said cross member on the side of said cross member opposite said tines and extending from said cross member in a direction opposite said tines and generally in alignment with said tines,

a tang and a handle,

said tang having a first generally straight flat part fixed to said hoe blade, a second straight part and a curved part connecting said second straight part to said first straight part,

said second straight part being fixed to said handle and disposed at an obtuse angle to said handle,

said base member being generally flat and resulting adjacently above said first straight flat part of said tang and disposed generally parallel thereto,

said tines extending above and forming an angle of approximately 110° relative to said platelike blade, and spaced clamp members extending around said base member and around said first straight flat part of said tang clamping said base member to said tang,

said tines having a generally straight elongated part adjacent said cross member extending to a tapered distal end,

the distal end of each of said tines being tapered downwardly toward said platelike blade at approximately 20° relative to said straight part of said tines to a substantially sharp edge.

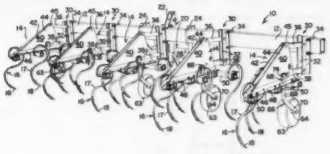
3,921,726

CULTIVATOR HAVING PLURALITY OF LATERALLY ADJUSTABLE TOOL-SUPPORTING BEAMS

Donald E. Connor, Plainfield, and Charles Boetto, Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,675
Int. Cl.² A01B 19/08
U.S. Cl. 172—646 10 Claims

1. In an agricultural gang-type cultivator adapted for connection to a draft vehicle, in combination, a tool bar having a centrally disposed hitch connection whereby it may be connected to the draft vehicle, a plurality of head brackets mounted on said tool bar in axially spaced relationship and each presenting laterally spaced attachment flanges, and a plurality of cultivator gangs, one for each head bracket, operatively connected to the tool bar in trailing relationship, each gang embodying a tool carriage in the form of a pair of vertically disposed laterally spaced plates having outturned horizontal bolting flanges extending along their lower edges, upper and lower draw links having their rear ends extending between and pivoted to said plates and having their forward ends extending between and pivoted to the spaced attachment flanges of the associated head bracket, said draw links, in combination with a portion of the head bracket and a portion of the tool carriage providing a parallelogram-type four bar linkage wherein the head bracket establishes a fixed link, the draw



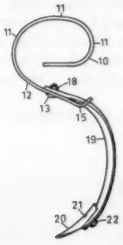
links establish swinging links, and the carriage establishes a vertically shiftable floating link, the attitude of which remains constant, a plurality of longitudinally spaced transversely extending tool-supporting beams removably secured to the underneath side of said bolting flanges, means for releasably clamping said tool-supporting beams to the bolting flanges in selected positions of axial adjustment whereby they may be caused to overhang said plates in either lateral direction, a ground tool mounted on each of said beams, a gauge wheel supporting bar having its upper end releasably and adjustably secured to one of said plates, and a ground-engaging gauge wheel mounted on the lower end of said supporting bar.

3,921,727

HARROW TINE

Helge Hojmark Andersen, Soro, and Bendix Nielsen, Lynge-Eskildstrup, both of Denmark, assignors to Kongskilde Maskinfabrik A/S, Soro, Denmark

Filed Jan. 3, 1974, Ser. No. 430,591
Int. Cl.² A01B 23/00
U.S. Cl. 172—708 1 Claim



1. A harrow tine for use with a harrow comprising:

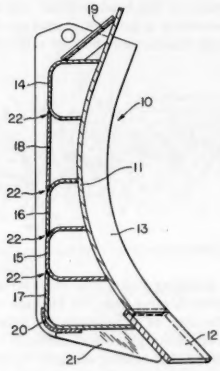
a rigid stalk; and

a spring bolted to said stalk and having a section mounted on and passing around a substantial portion of said harrow, said spring having a width at least twelve times its thickness and being provided with an opening through which said stalk is passed, the section of said spring mounted on and passing around a substantial portion of said harrow having substantially an elliptical shape, said spring being curved so that when said spring is bolted to said stalk the spring is under a tension, whereby a sure connection between said spring and said stalk is maintained.

3,921,728
WELDMENT FOR BULLDOZER BLADES

Thomas P. Casey, Burlington, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 13, 1974, Ser. No. 469,337
Int. Cl. A01b *15/00*
U.S. Cl. 172—745 **8 Claims**

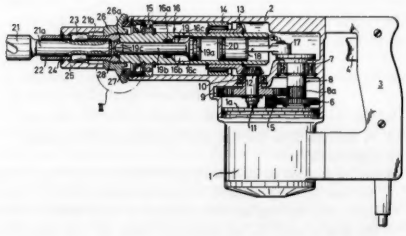


1. A weldment for a bulldozer blade comprising
a first member,
a groove of predetermined depth formed on a surface of said first member and terminating at one side thereof at a contiguous, raised dam of predetermined height above said surface,
a second member having a corner thereof disposed at said groove and closely adjacent to said dam,
common weld means at least substantially filling said groove and securing said first and second members together and a bulldozer blade including a push plate having adjacent pairs of said first and second members secured on a back side of said push plate.

3,921,729
ELECTROPNEUMATIC HAMMER

Peter Schmuck, Mauren, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Continuation of Ser. No. 308,666, Nov. 22, 1972, abandoned. This application May 29, 1974, Ser. No. 474,174
Claims priority, application Germany, Nov. 24, 1971, 2158503
Int. Cl.[2] E21C *3/22*
U.S. Cl. 173—14 **2 Claims**



1. An electropneumatic hammer arranged to impart a rotary and impacting action on a tool, comprising a housing, cylinder positioned within said housing forming an axially elongated bore having a forward end and a rearward end, a tool carrier mounted on and in communication with and extending forwardly from the forward end of the bore in said cylinder and arranged to hold a tool therein in an operating position, a striking piston mounted within and axially displaceable through the forward end of said cylinder into said tool carrier for imparting an impacting action to a tool positioned in the operating position in said tool carrier forwardly of the forward end of the bore in said cylinder, a driving piston positioned within and axially displaceable within the bore in said cylinder at the rearward end thereof, said driving piston being spaced rearwardly from said striking piston for forming an air cushion therebetween for transmitting the reciprocating action of the driving piston to said striking piston, means for reciprocating said driving piston within said cylinder so that through the medium of the air cushion therebetween said striking piston moves forwardly and rearwardly and in its forward motion strikes the tool in said tool carrier, the forward movement of said striking piston through the forward end of said bore into said tool carrier is limited by the tool positioned within the operating position in said tool carrier, openings in said cylinder communicating with the bore therethrough are located in said cylinder so that during impacting action said striking piston is restrained by the tool in said tool carrier from moving forwardly into the bore to the extent that the air cushion is exhausted through the openings in said cylinder whereby the air cushion is maintained between said striking piston and driving piston and, when the tool is not in the operating position within said tool carrier, said striking piston can move forwardly through the forward end of the bore in said cylinder into said tool carrier to the extent that the air cushion is opened to the opening in said cylinder and is no longer maintained between said striking piston and driving piston, wherein the improvement comprises means located within said tool carrier in the path of movement of said striking piston for securing said striking piston against axial movement when the opening in said cylinder communicates with the space between said striking piston and said driving piston for releasing the air cushion therebetween and for releasing said striking piston when a tool is inserted into the operating position within said tool carrier, said means being arranged to engage said striking piston frictionally and to hold it in position spaced forwardly of said driving piston so that the opening in said cylinder communicates with the space between said striking piston and driving piston, said striking piston having an axially extending section displaceable through the forward end of said bore in said cylinder into said tool carrier when a tool is not in the operating position in said tool carrier, said means comprises a ring located in said tool carrier contiguous to the forward end of the bore in said cylinder so that when a tool is in the operating position in said tool carrier the leading end of said axially extending section of said striking piston can pass through said ring in contact free relation for imparting an impacting action against the tool located within said tool carrier, said axially extending section of said striking piston has a cylindrically-shaped part spaced rearwardly from its leading end and said cylindrically-shaped part has a diameter greater than the diameter at the leading end of said striking piston, the interior surface of said tool carrier is shaped to provide an annular shoulder immediately forward of said ring and arranged to contact the rearward end of the tool and to define its operating position, said ring is a split ring formed of metal and is radially expandable, in the unexpanded state said split ring has an inside diameter less than the diameter of the cylindrically-shaped part of said axially extending section of said striking piston so that the inside diameter surface of said ring frictionally engages the cylindrically-shaped part of said axially extending section of said striking piston rearwardly from its leading end for securing said striking piston against axial movement, said tool carrier has a recess in its end contiguous to the forward end of said bore in said cylinder for receiving said ring, the surface of said recess extending in the axial direction has a frusto-conical configuration with the frusto-conical surfaces diverging in the direction toward said cylinder, the outer surface of said ring has a frusto-conical configuration and is arranged to correspond to and to seat in

closely fitting engagement against the frusto-conical surface in said recess, the end of said striking piston extending axially forward from the cylindrically-shaped part of said axially extending section thereof and which extends into said tool carrier is beveled forwardly from said cylindrically-shaped part to the leading end of said striking piston which contacts said tool carrier with said beveled surfaces arranged in converging relationship toward the end of said striking piston which impacts against the tool, and the end portion of the inner surface of said ring closer to said cylinder is correspondingly beveled to permit said striking piston to extend into contact with a tool in the operating position in said tool carrier without frictional contact between the cylindrically-shaped part of said axially extending section of said striking piston and said ring during normal operating conditions.

3,921,730

EARTH WORKING AND WORK SUPPORT MACHINE

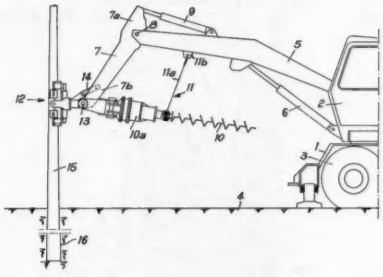
Jean G. Farre, Boulogne-sur-Seine, and Raymond M. Dassy, Meaux, both of France, assignors to Societe Anonyme: Poclain, Le Plessis-Belleville, France

Filed Apr. 15, 1974, Ser. No. 461,225

Claims priority, application France, Apr. 17, 1973, 73.13955

Int. Cl.² E21C *11/02*

U.S. Cl. 173—46 **4 Claims**



1. Handling and digging apparatus comprising a chassis, a jib pivoted on the chassis for pivotal movement about a horizontal axis, an arm pivoted by one end on the jib, a digging tool pivotally attached to the other end of the arm, and a handling tool permanently fixed to the same end of the arm as the digging tool close to the region of attachment of the digging tool to the arm.

3,921,731

HYDRAULIC IMPACT DEVICE

Carl Gösta Bernhard Ekwall, Saltsjobaden, and Sven Ingemar Johansson, Saltsjo-Boo, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed July 23, 1974, Ser. No. 490,985

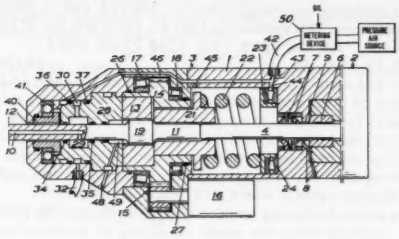
Claims priority, application Sweden, Aug. 2, 1973, 7310634

Int. Cl.² E21C *7/00*

U.S. Cl. 173—57 **8 Claims**

1. A hydraulic impact device intended for rock drilling, comprising:

a housing and an impact piston, said housing being divided into a hydraulic fluid section in which the impact piston is reciprocately powered, and a non-hydraulic section into which the forward end of the impact piston extends; a tool aperture provided in the non-hydraulic section for receiving the rear end of a drill stem or drill stem adapter; a flush medium supply chamber provided in the non-hydraulic section in communication with the tool aperture; and pressure air supply means provided in the non-hydraulic section of the housing and including means for coupling pressure air in front of and behind the flush medium



supply chamber establishing two pressure air barriers in the non-hydraulic section, one in front of and one behind the flush medium supply chamber relative to the impact direction.

3,921,732

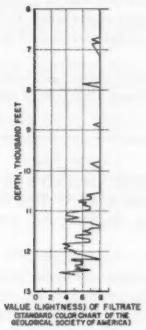
DETECTING GEOPRESSURED SUBTERRANEAN FORMATIONS DURING DRILLING OF A WELL

Edward B. Reynolds, Spring, Tex.; Donald M. Pert, New Orleans, La., and Aldo M. Zanier, Port Harcourt, Nigeria, assignors to Continental Oil Company, Ponca City, Okla.

Filed June 3, 1974, Ser. No. 475,713

Int. Cl.² E21B *47/06*

U.S. Cl. 175—50 **6 Claims**



1. A method for detecting changes in properties and characteristics of a subterranean formation during drilling operations comprising:

a. drilling a well in a subterranean formation utilizing a circulating drilling fluid;

b. periodically collecting formation samples from increasing depths;

c. preparing filtrates of aqueous slurries of said formation samples;

d. determining a color characteristic of said filtrates prepared from aqueous slurries of said formation samples taken from increasing depths; and

e. when said color characteristic of said filtrates begins to change rapidly with depth, instituting controlled drilling procedures.

3,921,733

METHOD OF DRILLING A BOREHOLE USING GELLED POLYMERS

Richard L. Clampitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 224,914, Feb. 9, 1972, abandoned. This application June 22, 1973, Ser. No. 372,825

Int. Cl.² C09K *7/00;* **E21B** *21/00, 43/22*

U.S. Cl. 175—65 **14 Claims**

1. In a method for drilling a borehole into the earth wherein a drill bit is actuated in said borehole and penetrates a subterranean formation in the presence of a drilling fluid, and said drilling fluid, together with formation solids entrained therein, is removed from said borehole, the improvement wherein said drilling fluid comprises an aqueous gel, and wherein said gel comprises water to which there has been added:

a water thickening amount of a water-dispersible polymer selected from the group consisting of: polyacrylamides and polymethacrylamides wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; crosslinked polyacrylamides and crosslinked polymethacrylamides wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; polyacrylic acid and polymethacrylic acid; polyacrylates; polymers of N-substituted acrylamides wherein the nitrogen atoms in the carboxamide groups can have from 1 to 2 alkyl substitutents which contain from 1 to 4 carbon atoms; copolymers of acrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; and mixtures of said polymers;

a sensible amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which is sufficient to gel said water when the valence of at least a portion of said metal is reduced to said lower valence state; and

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state.

3,921,734

RAISE BORING HEAD AND ROLLING CUTTER ARRANGEMENT THEREFOR

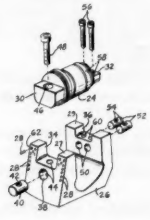
Robert D. Goodfellow, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Oct. 17, 1972, Ser. No. 300,353

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² E21B *9/08;* **E21C** *23/00*

U.S. Cl. 175—364 **1 Claim**



1. In a rolling cutter; a rotatable outer part, a central support shaft rotatably supporting said outer part and having end portions projecting axially beyond the respective ends of said outer part, saddle means having generally parallel legs fixed relative to each other and spaced to receive said rotatable part therebetween, a slot extending into one end of each said leg part and each having spaced parallel side walls and a bottom wall perpendicular to the side walls, each end portion of said central support shaft being receivable into a respective slot and having flat parallel sides engaging the side walls of the slot and a flat bottom perpendicular to said sides and engaging the bottom wall of the respective slot, each said leg having at least one hole extending therethrough in a direction substantially parallel to said support shaft and spaced downwardly in the respective leg from said bottom wall of said slot, a barrel nut removeably mounted in each hole, and a bolt for each barrel nut extending downwardly through the end portion of the support shaft which is disposed above the nut and downwardly through the portion of the respective leg disposed between the bottom wall of the slot and the said hole in which the barrel nut is mounted and threadedly engaging the barrel nut whereby each said end portion is fixed in the respective slot and clamped against the bottom wall thereof.

3,921,735

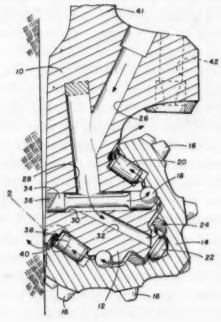
ROTARY ROCK BIT WITH CONE MOUTH AIR SCREEN

Theodore Rivers Dysart, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 27, 1975, Ser. No. 553,763

Int. Cl.² E21B *9/10;* **E21C** *13/00;* **E21B** *9/35;* **F16C** *33/78*

U.S. Cl. 175—337 **5 Claims**



1. A drill bit for connection with a drill string that includes a drilling fluid passage, comprising:

a body;

a bearing shaft supported from said body;

a roller cutter adapted to be rotatably mounted on said bearing shaft;

bearing means supporting said cutter on said bearing shaft;

a passage within said body adapted to be in communication with the drilling fluid passage in said drill string when said drill bit is connected to the drill string;

a passage in said bearing shaft communicating between said passage within said body and said bearing means; and

screen means between said bearing shaft and said roller cutter.

3,921,736

MOTION DETECTOR FOR A WEIGHING SCALE

Robert M. Rogers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Apr. 29, 1974, Ser. No. 464,766

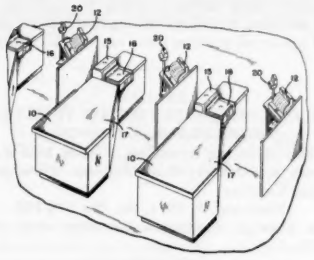
Int. Cl.² G01G *3/14*

U.S. Cl. 177—1 **10 Claims**

1. A method of detecting motion of a weighing scale platform including the steps of

periodically generating electric signals representing weight, transferring said weight signals to a memory during each period,

comparing said incoming weight signals with that stored in said memory prior to transfer of said weight signals, and

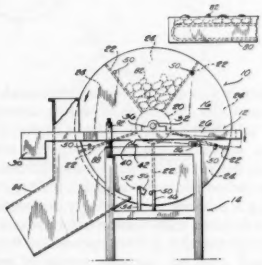


generating a motion signal whenever there are two or more successive weight changes in the same direction.

3,921,737
WEIGHING APPARATUS

Edwin F. Pleus, Sun Prairie, Wis., assignor to Aunt Nellie's Foods, Inc., Clyman, Wis.

Filed Feb. 27, 1974, Ser. No. 446,155
Int. Cl.² G01G *13/22, 13/24*
U.S. Cl. 177—86 **16 Claims**

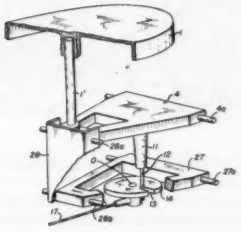


1. Weighing apparatus comprising:
a support frame;
a balance beam support member pivotally mounted on said support frame, said member having a counterweight mounted on one end thereof tending to cause said balance beam support member to pivot in one direction;
a drum member having a plurality of weighing bins formed therein, each bin adapted to receive a quantity of material to be weighed, said drum member rotatably mounted on said balance beam support member with the axis of rotation of said drum member located on the opposite side of the pivot point of said balance beam support member from said counterweight whereby the weight of said drum and the contents of one of said weighing bins will tend to pivot said balance beam support member in the opposite direction, said drum member adapted when rotated in said one direction to discharge material from said weighing bins; and
a releasable stop means for said drum adapted when said balance beam support member is pivoted in said opposite direction to release said drum and allow it to rotate about its axis of rotation in said one direction due to the weight of the material to be weighed in one of said weighing bins to thereby cause the material to be discharged from said one weighing bin by gravity.

3,921,738
SPRING BALANCE

Karl Otto Schmidt, Idar-oberstein, Germany, assignor to Firma Gebrueder Schmidt, Idar-Oberstein, Germany

Continuation-in-part of Ser. No. 393,755, Sept. 4, 1973, Pat. No. 3,799,282. This application Jan. 3, 1974, Ser. No. 430,390
Claims priority, application Germany, Aug. 13, 1973, 2340838The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.
Int. Cl.² G01G *23/26*
U.S. Cl. 177—230 **6 Claims**



1. A weighing scale comprising:
a load-receiving platform;
a pair of parallel levers with horizontal pivotal axes lying one above the other underneath said platform, said levers forming part of a parallelogrammatic linkage further including a vertical member rigid with said platform articulated to said levers for downward movement under load against a spring force;
a depending projection on the underside of one of said levers;
a deflecting element rotatable about a vertical axis offset from said projection, said element having a radial slot generally parallel to said pivotal axes, said projection engaging in said slot for rotating said element about said vertical axis in response to a vertical movement of said platform; and
a substantially horizontal pointer coupled with said element for rotary entrainment thereby.

3,921,739
WALKING PLATFORM FOR DRILLING RIGS AND OTHER HEAVY MACHINERY

Robert N. Rich, and J. C. Owens, both of Houston, Tex., assignors to Farmer Foundation Company and Hughes Tool Company, both of Houston, Tex.

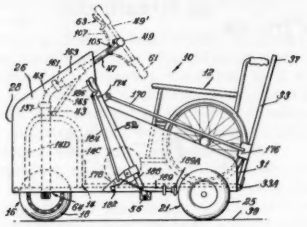
Filed Sept. 30, 1974, Ser. No. 510,680
Int. Cl.² B62D *57/02*
U.S. Cl. 180—8 C **10 Claims**

1. A heavy equipment rig capable of walking between adjacent working sites, comprising:
a lower base means,
a middle base means,
an upper base means linearly slidable with respect to said middle base means,
revolving means interconnecting said middle base means with said lower base means,
actuating means linearly and slidably interconnecting said middle base means with said upper base means, and
lifting means depending from said upper base means and retractable above the lower portion of said lower base means.

3,921,740
SELF-PROPELLED VEHICLE

Larry G. Forster, Shoshoni, Wyo., assignor to Chair-E-Yacht, Inc., Shoshoni, Wyo.

Filed June 12, 1974, Ser. No. 478,677
Int. Cl.² B62D 61/08
U.S. Cl. 180—26 R 12 Claims

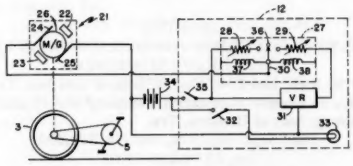


1. In a self-propelled vehicle, the improvement comprising:
a vehicle frame;
front and rear wheel assemblies connected to said frame;
a vehicle body mounted on said frame, said body for supporting and carrying the operator of the vehicle;
drive means mounted on said frame having an output connected drivingly to a driven one of said wheel assemblies for powering the vehicle;
driving and braking means for controlling the speed of said drive means and for braking purposes;
mounting means disposed above and in alignment with the vertical axis of said driven wheel assembly and connecting rotatably the driven one of said wheel assemblies to said body for enabling said driven wheel assembly to rotate continuously uninterruptedly and freely about a vertical axis in a 360° circle of rotation; and
manually operable steering control means rotatably mounted on the frame for rotating said driven wheel assembly about its axis in said 360° circle of rotation.

3,921,741
BICYCLE WITH ELECTRIC MOTOR ASSIST

Irwin P. Garfinkle, and Robert J. McNair, both of Cincinnati, Ohio, assignors to Avco Corporation, Cincinnati, Ohio

Filed July 11, 1974, Ser. No. 487,522
Int. Cl.² B60K 1/04
U.S. Cl. 180—34 7 Claims

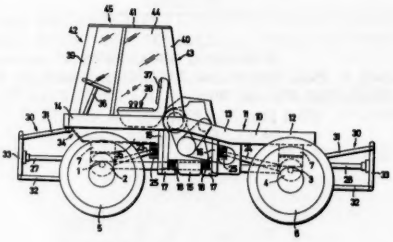


1. An electric power assisted vehicle comprising:
a frame;
wheels rotatably mounted on said frame;
a pedal system for driving at least one of said wheels, said driving system including an overdrive clutch mechanism which permits the pedals to power said drive wheel while at the same time preventing the pedals from being driven by said wheel;
drive motor means connected to said one wheel;
voltage generator means coupled to one of said wheels;
a rechargeable battery source; and
electric power connecting means selectively coupling said battery source to said motor or said generator, said electric power connecting means including a combination motor and generator control unit, said unit having separate motor and generator control sections therein, each comprising manually variable current regulating resistor elements, each having a power disconnected position, and including means for biasing said resistor elements to said power off position when released by an operator.

3,921,742
VEHICLE, ESPECIALLY MOTOR VEHICLE FOR AGRICULTURAL PURPOSES

Oswald May, Bonn, and Arno Gego, Aachen, both of Germany, assignors to Klockner-Humbolt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Aug. 9, 1971, Ser. No. 170,188
Claims priority, application Germany, Aug. 10, 1970, 20396672
Int. Cl. B60k 17/30
U.S. Cl. 180—50 7 Claims



1. In a vehicle, especially for agriculatural purposes; a frame, front and rear driving axles, spring means connecting said axles to said frame, driving wheels of equal size on said axles, a drive engine in the frame between said axles and having the axis thereof extending in the transverse direction of the vehicle, a torque converter adjacent the engine at one end thereof having a primary part drivingly connected to the engine, a power dividing transmission adjacent said torque converter and driven thereby, a drive connection from said transmission to each axle, the common center of gravity of said engine and said primary part being located below said frame substantially midway between said axles, said spring means being rubber springs, said rubber springs forming transverse guiding means for said axles, a longitudinal member connected at one end to each axle and extending therefrom toward the longitudinal center of the frame and pivotally connected at the other end of the frame, support members extending traversely of the frame and therebeneath on opposite sides of the engine, means resiliently connecting the engine to said support members, and bend resistant tie bars connecting said support members to said frame, and spherical bearings connecting said other ends of said longitudinal members to said support members.

3,921,743
VEHICLE TRACTION UNITS

Jack N. Parrish, North Vancouver, Canada, assignor to Demac Engineering Ltd., Vancouver, Canada

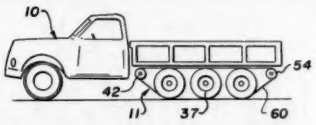
Filed Feb. 4, 1974, Ser. No. 438,996
Int. Cl.² B62D 55/04
U.S. Cl. 180—9.2 C 10 Claims

1. A traction unit for converting a standard truck to a tracked vehicle and utilizing the drive axle assembly of said truck, comprising
a frame member for supporting engagement beneath the truck chassis,

means for detachably clamping the frame member rigidly to the chassis,

a plurality of load bearing wheels journalled on bearing axles carried by the frame on each side thereof,

means for mounting the drive axle assembly of said truck on said frame member,



drive sprocket wheels for driving connection to the axles of said axle assembly and in alignment with the load bearing wheels on opposite sides of the frame member, and

a pair of endless track belts for engagement, one on each side of said frame, around said load bearing and sprocket wheels.

3,921,744

WHEELCHAIR WITH DETACHABLE DRIVE MEANS

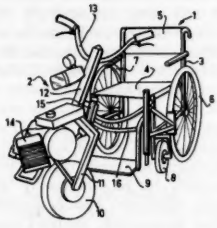
Robert Benoit, 2 place de la Fontaine d'Ouche, 21000 Dijon, and Andre Mairet, 21440 Chanceaux, both of France

Filed Oct. 2, 1974, Ser. No. 511,363

Claims priority, application France, Oct. 2, 1973, 73.35107

Int. Cl.² B60K *3/00*

U.S. Cl. 180—13 **9 Claims**



1. In combination, a wheelchair and a drive assembly for said wheelchair, said drive assembly comprising a motor and a wheel driven by said motor disposed forwardly of said wheelchair, and means carried by said drive assembly and extending rearwardly of said motor and driven wheel to both sides of said wheelchair for detachably connecting said drive assembly to said wheelchair, said means including means disposed on opposite sides of said wheelchair when said drive assembly is connected to said wheelchair and within reach of and manipulable by the hands of the occupant of the wheelchair to effect the connection and disconnection of said drive assembly to and from said wheelchair.

3,921,745

ELECTRIC BICYCLE

Robert P. McCulloch, Los Angeles, and Stephen Hagar Smith, San Pedro, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed July 23, 1973, Ser. No. 381,447

Int. Cl. B62d *3/00*

U.S. Cl. 180—33 C **24 Claims**

1. An electric bicycle comprising:

a bicycle;

a battery carried by the frame of said bicycle;

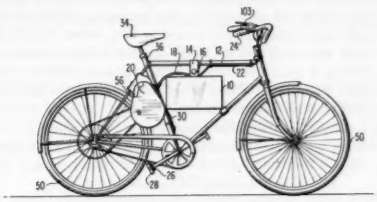
a direct current motor carried by the frame of said bicycle;

manually operable throttle means carried by the frame of said bicycle; and;

a variable frequency, variable pulse width controller circuit carried by the frame of said bicycle and electrically connected to said battery, said direct current motor, and to said throttle means for controlling the flow of current from said battery to said motor in response to said throttle means, said controller circuit comprising:

an electronic switch having a control terminal,

a diode,



circuit means connecting said battery, said electronic switch and said direct current motor in series and connecting said diode in parallel with said motor opposing the flow of direct current from said battery through said electronic switch,

means for sensing the direct current flowing through said motor, and

means operatively connected and responsive to said sensing means for controlling the frequency and duration of the conduction of said electronic switch.

3,921,746

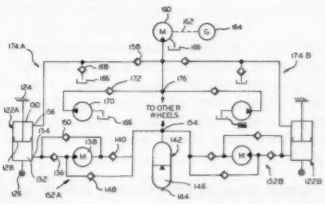
AUXILIARY POWER SYSTEM FOR AUTOMOTIVE VEHICLE

Alexander J. Lewus, 9844 N. 11th Ave., Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 313,242, Dec. 28, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,293

Int. Cl.² B60K *25/10*

U.S. Cl. 180—53 R **10 Claims**



1. An auxiliary power and suspension system for an automotive vehicle or the like, comprising a vehicle frame, a body mounted on the frame, auxiliary equipment for the vehicle and a plurality of supporting wheels for the vehicle, said auxiliary power and suspension system comprising:

suspension means for mounting the wheels on the vehicle frame, said suspension means allowing limited vertical movement of the wheels relative to the frame in response to irregularities and changes in contour of terrain traversed by the wheels;

power transmission means, connected to at least two wheels and to the vehicle frame, for actuation in response to relative vertical movement therebetween;

and power conversion means, connected and actuated by said power transmission means, for converting mechanical kinetic energy applied to said power conversion means through said power transmission means into another energy form more readily useable in operation of said auxiliary equipment;

said power conversion means comprising hydraulic pump means comprising a plurality of double-acting cylinders, a reciprocal piston dividing each into two chambers, and inlet-outlet ports in said chambers;

a transmission line communicating with said chambers through said inlet-outlet ports, valve means in the transmission line to regulate the flow of hydraulic fluid;

and hydraulic motor means communicating directly through said transmission line and valve means with said chambers and actuated by the hydraulic pressure therein; said motor means, transmission line, valve means and at least one chamber of each double-acting cylinder comprising a generally fluid tight hydraulic circuit substantially completely filled with fluid and operable independent of any system reservoir; and

said auxiliary power and suspension system supporting the entire weight of the vehicle which acts on said wheels.

3,921,747
STEERING COLUMN SUPPORT STRUCTURE FOR VEHICLES

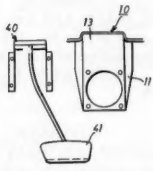
Ichiro Suzuki, and Hiroyuki Watanabe, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Mar. 1, 1974, Ser. No. 447,338

Claims priority, application Japan, Mar. 10, 1973, 48-28427

Int. Cl.² B60K *26/00*; B62D *1/16*;

U.S. Cl. 180—78 **6 Claims**



1. A support structure for a steering column assembly comprising an upper and a lower column tubes telescopically coupled to each other for journalling a steering shaft therein, said steering shaft having an upper and a lower shafts telescopically coupled to each other, energy absorbing means assembled with said column assembly for absorbing a forward impact energy exerted thereon from a steering wheel mounted on the upper end of said steering shaft during the axially relative displacements of said column tubes,

a cowl panel member located under a front windshield of the vehicle and being a portion of the vehicle body structure, and a main support member secured to said cowl panel member, said main support member having at is front end a receiving portion spaced rearwardly isolated a given distance from a firewall located in front of the occupant compartment of the vehicle to function as a load reaction member, said upper column tube being releasably secured on the rear portion of said main support member and said lower column tube being rigidly secured at its front end on said receiving portion of said main support member to insure that said lower column tube may have no influence from any deformation of the firewall.

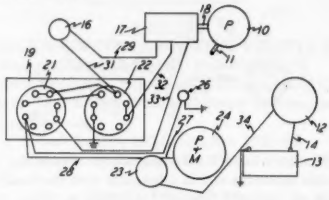
3,921,748
VEHICLE POWER STEERING ELECTRIC CIRCUIT

Donnell L. Dunn, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 24, 1974, Ser. No. 517,424

Int. Cl.² B62D *5/06*

U.S. Cl. 180—79.2 R **3 Claims**



1. An electric circuit for a vehicle having a battery and a power steering system which includes a hydraulic pump and a hydraulic line, comprising an electric flow-switch connected with said hydraulic line and being of the type responsive to the flow of hydraulic fluid through said switch and including a movable electric connector positionable in electrically normally closed and open positions according to flow and a lack of flow of hydraulic fluid through said flow-switch, an additional electric switch electrically connected in series with said flow-switch and said battery for connecting and disconnecting said flow-switch relative to said battery, an electric motor and a second hydraulic pump combination, an electric relay system electrically connected with said electric motor and with said flow-switch and being automatically responsive to the said positions of said electric connector for electrically energizingly connecting and disconnecting said electric motor with said battery, said electric relay system including three relay switches with each thereof having an electric coil and electric connectors which are set in electrically normally open and closed positions in response to electric current in each said coil, the said coils of two of said relay switches being electrically connected to respective electric sides of said electric flow-switch to be alternately electrically connected with said additional switch according to flow of fluid through said flow-switch, the said electric connectors of said two relay switches being electrically connected to said additional electric switch, the said two relay switches being electrically connected together and with one thereof being grounded and forming an electric ground for said two relay switches and the other thereof being electrically connected to said coil of the third one of said relay switches, said connector of said third one of said relay switches being electrically connected to said electric motor and said battery and being arranged to be electrically closed when its said coil is electrically energized, to thereby energize said electric motor from said battery.

3,921,749
ANTI-CRASH RADIO-DETECTOR SYSTEM FOR AUTOMOTIVE VEHICLE

Shoji Kawada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 22, 1974, Ser. No. 516,906

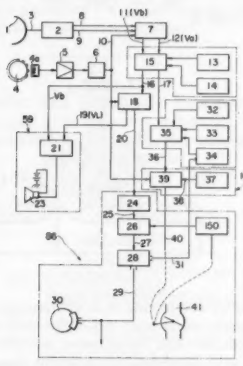
Claims priority, application Japan, Oct. 24, 1973, 48-120246; Oct. 24, 1973, 48-120247; Oct. 24, 1973, 48-120248

Int. Cl.² B60T *7/16*

U.S. Cl. 180—98 **4 Claims**

1. An anti-crash radio detector system for automotive vehicle, which comprises a radio-electric or radar detector projecting ahead of the vehicle a radio electric wave beam and receiving the echoes reflected by fixed or movable obstacles appearing in front of the vehicle and further producing from informations on said echoes another information relating to velocity of approach of the vehicle equipped with this detector

in relation to a fixed or movable obstacle and still another information relating to a distance between said obstacle and the vehicle, means for producing an information representing an actual speed of the vehicle, an electric computer for determining on the basis of said three informations a brake controlling signal and an acceleration controlling signal, means for automatically actuating the brake system upon receiving said



brake controlling signal, means for automatically actuating the throttle valve mechanism upon receiving said acceleration controlling signal, and means operatively connected to the steering wheel mechanism and the turning direction indicating mechanism for blocking communication between said computer and both of said brake system and said throttle valve mechanism when the steering wheel or the turning direction indicating mechanism is manually operated.

3,921,750

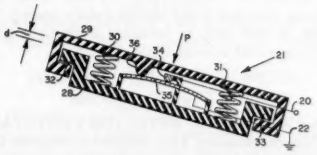
VEHICLE BRAKE WARNING LIGHT SYSTEM ACCELERATOR PEDAL SWITCH

Max Shames, 1213 Preston Way, Venice, Calif. 90291

Division of Ser. No. 379,239, July 16, 1973. This application June 20, 1974, Ser. No. 481,054

Int. Cl.[2] B60Q *1/30*; H01H *3/14*, *15/18*

U.S. Cl. 180—103 **1 Claim**



1. In a vehicle equipped with a battery, a brake light, a normally open brake light switch connected between the battery and brake light, a brake pedal for closing the brake light switch when depressed to thereby energize the brake light, a foot pressure operated accelerator means for accelerating the vehicle, and a vehicle brake warning light system for energizing said brake light for a given time period in response to removal of an operator's foot pressure on the accelerator means, a normally closed pedal switch for said foot operated accelerator means responsive to a given pressure applied by the operator's foot to open and responsive to removal of the operator's foot to close, said accelerator pedal switch including lower and upper plates having overlapping spaced flange portions so that they can move towards and away from each other over a limited distance; spring means between said plates biasing them apart; a fixed contact on the lower plate comprising one side of the switch; a flexible metal member connected to the lower plate in juxtaposed relation to said fixed contact comprising the other side of said switch connected to ground, said flexible metal member being bowed upwardly to engage said fixed contact in the absence of foot pressure on said pedal switch, foot pressure on the pedal switch urging the upper plate towards the lower plate; and projecting means on the upper plate engaging the metal member to cause it to assume a reversed bowed position when said upper plate moves towards the lower plate to result in a snap action which breaks the engagement of the metal member with said fixed contact thereby opening the pedal switch.

3,921,751

METHOD AND APPARATUS FOR AUTOMATICALLY MAINTAINING THE SPEED OF AN AUTOMOBILE AT A CONSTANT PRESELECTED VALUE

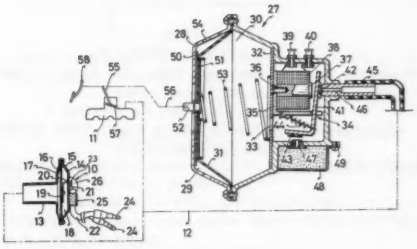
Naoji Sakakibara, Chiryu, and Takeshi Nakane, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 6, 1973, Ser. No. 338,529

Claims priority, application Japan, Mar. 7, 1972, 47-23305

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—108 **12 Claims**



1. A speed control system for an automotive vehicle having throttle valve means, comprising:

first means for generating a first signal corresponding to the actual automotive speed,

second means for generating a second signal corresponding to the desired automotive speed,

third means comprising a strain gauge engine vacuum sensor for generating a force due to a pneumatic pressure difference which is caused by the change of opening of the throttle valve means for generating a negative feedback signal corresponding to the automotive engine vacuum pressure produced by the throttle valve means, said negative feed back signal varying inversely with the opening of the throttle valve means, and

fourth means for combining said first, second and negative feedback signals to form an error signal to control the opening of the throttle valve means.

3,921,752

MULTI CUSHION FLEXIBLE SUPPORT BAG WITH SURFACE PRESSURE VALVING FOR AIR CUSHION VEHICLE APPLICATION

Dwain G. Gregg, Rte. 1, Senecaville, Ohio 43780

Filed Aug. 26, 1974, Ser. No. 500,789

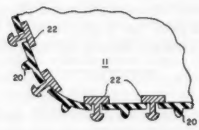
Int. Cl.[2] B60V *1/11*

U.S. Cl. 180—125 **6 Claims**

1. In an air cushion vehicle which travels on a cushion of air which is enclosed by a flexible cushion-enclosing member, the improvement comprising:

means for reducing the frictional drag on the vehicle as it traverses an obstacle, said means for reducing frictional drag comprising a plurality of valves having operating elements for opening and closing said valves which release lubricating fluid upon contact with an obstacle, said valves being located on the surface of the member which encloses the air cushion on which the vehicle travels, the

operating elements of said valves projecting beyond said cushion-enclosing member in the direction of travel of



the vehicle so that said operating elements contact the obstacle before said cushion-enclosing member contacts the obstacle.

3,921,753

AIR CUSHION VEHICLE

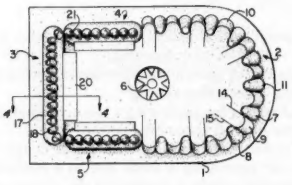
Dominique Etienne Louis Pont, Villa "Ker Alguy", 1 rue de Kerpape, 56 260 Larmor Plage, France

Filed Aug. 5, 1974, Ser. No. 495,045

Claims priority, application France, Aug. 7, 1973, 73.28760

Int. Cl.² B60V 1/16

U.S. Cl. 180—127 **11 Claims**



1. An air cushion vehicle comprising:

air cushion means for forming a pressurized air cushion beneath the vehicle to support the vehicle above a surface,

said air cushion means being defined at least a portion of the front of the vehicle by a flexible skirt having a forward row formed of a plurality of aligned, generally downwardly extending finger-like projections which are operatively connected at their upper ends to a rigid part of the vehicle, the said projections being of generally truncated form, tapering inwardly towards their lower ends,

each projection being enclosed and including means for inflating each projection to a pressure higher than that of the air cushion, each projection being tilted downwardly and inwardly towards the interior of the air cushion,

adjacent ones of said projections being joined together by an apron connected to both of said adjacent projections and bowed convex outwardly by the force of said air cushion, at least some of said aprons including extensions extending inwardly toward the interior of the air cushion from said row of projections, a part of said extensions being joined to a rigid part of the vehicle within the area of the air cushion.

3,921,754

MUFFLER HAVING A CONNECTION BETWEEN ITS DISKS AND THE TUBE LENGTHS EXTENDING THERETHROUGH

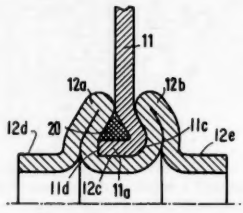
Rainer Hess, Vorderlohweg 21, 7602 Oberkirch, Germany

Filed Mar. 26, 1974, Ser. No. 455,034

Claims priority, application Germany, Mar. 29, 1973, 7336778; May 11, 1973, 2323951

Int. Cl.² F01N 1/00

U.S. Cl. 181—35 R **8 Claims**



1. In a muffler comprising an outer housing, a pair of apertured disks mounted at inlet and outlet ends of said housing, and a pair of inlet and outlet tubes extending through the apertures of said disks; the improvement wherein:

said disks each include:

a main body portion, and

an aperture-defining flange having an inner end integral with said main body portion, and an outer free end;

said flange extending substantially perpendicularly relative to said main body portion from said inner end to said outer end, and being in engagement with a tubular-shaped segment of a respective tube; and

said tubes each comprising:

first and second tubular-shaped portions extending away from opposite sides of said disk, and

a pair of beads defined by outwardly folded sections of said tube located between said first and second tubular-shaped portions, the beads being situated at opposite sides of said tubular-shaped segment and extending completely around opposite ends of said disk aperture; one of said beads being bent about said inner flange end and being seated tightly against one side of said disk, and the other bead being bent about said outer flange end and being seated tightly against the other side of said disk, to establish a gas-tight connection between said tube and said disk.

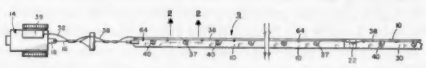
3,921,755

TOWABLE SEISMIC DETECTOR CONVEYANCE

Ben B. Thigpen, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Continuation-in-part of Ser. No. 139,426, May 3, 1971, Pat. No. 3,825,886, and a continuation-in-part of Ser. No. 171,818, Aug. 16, 1971, abandoned. This application Oct. 1, 1973, Ser. No. 402,640

Int. Cl.³ G01V 1/20

U.S. Cl. 181—122 **4 Claims**

1. A towable seismic detector conveyance comprising:

a substantially flat, long, flexible support member,

said member having a substantially uniform width throughout its length, and the width dimension of said member being considerably greater than the thickness dimension of said member to prevent any portion of said member

from overturning when said member is being dragged over extended surfaces of the earth;

a multi-conductor cable longitudinally mounted on said support member;

a plurality of longitudinally spaced apart seismic detectors carried by said member, said detectors being grouped into seismic detector arrays;

means for electrically connecting each detector array to a pair of conductors in said cable; and

said cable being adapted for connection to a multi-channel seismic signal utilization apparatus.

3,921,756

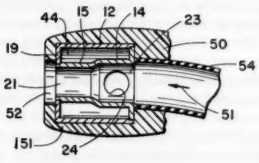
ACOUSTIC EAR MOLD FOR HEARING AID

Rubein V. Johnson, 2432 Court St., Muskogee, Okla. 74401

Filed Oct. 23, 1973, Ser. No. 408,943

Int. Cl.² A61B *7/02*

U.S. Cl. 181—135 **7 Claims**



1. In a hearing aid ear mold insertable into the ear canal and having a longitudinal conduit for the passage of sound wave energy from a hearing aid, to the tympanic membrane of the ear, the improvement comprising a metal structure having:

a. a central thin walled metal tube forming said conduit, connected at one end by tubular means to said hearing aid, the other end inserted into the ear;

b. an outer thin walled metal tube coaxial with said central tube, and forming an annular space, closed by annular end walls, sealing the space between the ends of said two tubes;

c. an opening in the wall of said central tube, joining said annular space and the space inside said conduit.

3,921,757

BUILDING EVACUATION AND RESCUE APPARATUS

Thomas N. Kennedy, 300 E. Granger No. 23, Modesto, Calif. 95350

Filed Aug. 6, 1974, Ser. No. 495,232

Int. Cl.² A62B *1/22, 1/20*

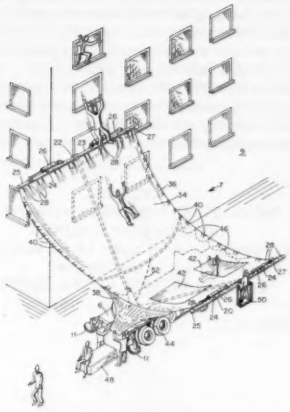
U.S. Cl. 182—48 **8 Claims**

1. An apparatus for rescuing a person who is falling from a tall structure by gradually slowing his speed of descent, comprising:

two adjustable booms positionable proximate to the tall structure and elevatable above the ground;

an upward opening concave safety net suspended between the booms, said booms raising the safety net above the ground; and

a lateral cross arm attached to the free end of each of the booms for laterally spreading the safety net between the booms to form two wide sloping sides in the safety net so that the person being rescued initially engages one of the sloping sides and thereafter slides down and up the concave surface of the safety net, whereby said safety net gradually slows the speed of descent, the concave safety net includes an upper section and a lower section, said upper section being attached to said lateral cross arms and forming a concave section between the booms, said lower section extending at least from one margin of the concave upper section to the other, opposite margin of the concave section and forming a laterally sloping exit trough beneath the upper section and extending completely thereacross through which the person being rescued can exit from the apparatus.



3,921,758

AERIAL LADDER TRUCK

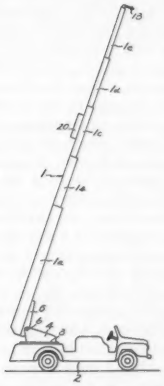
Tetsuo Kozai, Osaka, Japan, assignor to Morita Fire Pump Mfg. Co., Ltd., Osaka, Japan

Filed Aug. 27, 1974, Ser. No. 501,190

Claims priority, application Japan, Mar. 9, 1974, 49-27484; Mar. 9, 1974, 49-27485

Int. Cl.² E06C *5/04*

U.S. Cl. 182—67 **3 Claims**



1. In an aerial truck assembly to be mounted on the rear of a fire truck including a first elongated channel shaped ladder unit having laterally spaced, longitudinally extending guide rail means along its top thereof and having means at one end for mounting same to a fire truck, a plurality of additional and separable elongated channel shaped ladder units, each unit having spaced guide rail means along the top thereof, each of said additional ladder units positioned within said first ladder unit and within one another in nesting relationship, each succeeding ladder unit being of a width less than the width of the preceding ladder unit, each of said plurality of ladder units being extendable from and retractable within one another,

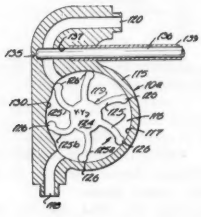
and roller means positioned between the mating surfaces of each said guide rail means of each of said interfitted ladder units to permit easy relative movement between each ladder unit, the improvement of means for removing snow, ice and the like from the longitudinally extending guide rail means of each of said ladder units, said snow and ice removal means comprising scraper means mounted in operative relationship with each of said ladder units adjacent each of said roller means and on opposite sides thereof for engaging the surface of the respective guide rail means of each of said ladder units during the extending and the retraction of each of said ladder units with respect to one another.

3,921,759

OIL DRAIN PUMP ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

Charles F. Bottum, Coeur d'Alene, Idaho, assignor to Lyle E. White, Spokane, Wash., a part interest

Filed July 18, 1974, Ser. No. 489,705
Int. Cl.² F01M *11/04*
U.S. Cl. 184—1.5 **5 Claims**



1. Oil drain pump assembly for internal combustion engines having a crank case with a threaded gravity drain opening therein, comprising:

a pump assembly housing having a central pump cavity formed therein defined by a continuous circumferential wall with an arcuate cam surface along said wall extending between an inlet opening and an outlet opening;

a threaded adapter complementary to the threaded drain opening for insertion into the opening to operatively interconnect the housing to the crankcase, said adapter having a aperture formed therein communicating with the cavity inlet to enable crankcase oil to drain through the adapter aperture into the central pump cavity;

a pump body rotatably mounted in the cavity for rotation about the longitudinal axis to receive oil through the inlet and to pump the oil from the cavity out the outlet;

said pump body comprised of a plurality of radially extending flexible impellers operatively having outer ends in wiping engagement with the wall of the pump cavity;

a motor affixed to the housing having a shaft connected to the pump body for rotating the pump body to successively move the impeller ends into engagement with the cam surface to effect a volume change between adjacent impellers to pump the oil therefrom; and

valve means mounted in the cavity outlet for selectively opening and closing the outlet, independent of operation of said motor.

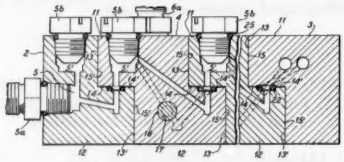
3,921,760

MODULAR DIVISIONAL FEEDER

Richard T. Brownrigg, Shaker Heights, Ohio, assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,781
Int. Cl.² F01M *1/06*; F16N *7/14*
U.S. Cl. 184—7 E **8 Claims**

1. In a cyclic, single line lubricant distributor, comprising a pair of end members and a plurality of intermediate members sequentially disposed in a line therebetween, with each successive member in abutting engagement with the adjacent preceding member, each intermediate member having a reciprocable piston and hydraulic circuitry cooperable with hydraulic circuitry in the other of said members for hydraulically effecting progressive displacement of the respective pistons from one limiting position to another, the improvment wherein each of said members has a portion overlying a cooperable portion of the adjacent member in direction transverse



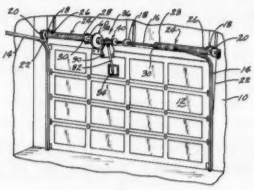
to said line, respective means extending transverseiy to said line independently connecting each successive member with the preceding member, the cooperable meeting faces of overlying portions of adjoining members having mating fluid ports opening thereon for the operative connection of the fluid circuitry of such members, with said connecting means applying compression forces on such cooperable meeting faces, one of said members having an inlet port for the lubricant to be distributed and each intermediate member having outlet ports for the discharge of lubricant therefrom.

3,921,761

METHOD AND MEANS OF WINDING TORSION SPRING

Leland C. Votroubek, Cedar Rapids, and Duane H. Nelsen, Avoca, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Apr. 12, 1974, Ser. No. 461,023
Int. Cl.² F03G *1/08*; E05F *11/00*
U.S. Cl. 185—39 **11 Claims**



1. In combination:

stationary support means;

a torsion spring having first and second ends, said first end being fixed to said support means and said second end being yieldably twistable with respect to said first end about a first axis;

gear means comprising at least one rotatable gear member having a plurality of annular teeth thereon;

an elongated worm gear drivingly engaging said annular teeth of said one gear member whereby rotation of said worm gear about its longitudinal axis causes rotation of said one gear member;

coupling means coupling said worm gear to said one gear member to hold said worm gear in driving engagement with said teeth;

stop means associated with said worm gear for engaging said support means to hold said worm gear against swinging movement in at least one direction about said first axis of said torsion spring;

grasping means on said gear means for detachably rententively engaging said second end of said torsion spring, said grasping means being drivingly connected to said one

gear member whereby rotation of said worm gear about its longitudinal axis causes rotation of said one gear member, said grasping means and said second end of said torsion spring;

said worm gear having means thereon for connection to a rotational prime mover for rotating said worm gear about its longitudinal axis,

said worm gear being rotatably mounted to a worm gear support means, said coupling means rotatably coupling said worm gear support means to said one gear member whereby said one gear member is free to rotate about said first axis independently from said worm gear.

3,921,762

VEHICLE LIFT ADAPTER

Edgar B. Provine, III, Memphis, Tenn., assignor to Dover Corporation, Washington, D.C.

Filed Oct. 26, 1972, Ser. No. 300,982

Int. Cl.² B66F 7/28

U.S. Cl. 187—8.75 **3 Claims**

1. A vehicle lift adapter comprising a base member adapted to slide to and fro along typical lift arm structure of the vehicle lift, main pin means having shank and head portions, said base member being provided with a recessed aperture pivotally receiving said main pin means with said shank portion thereof protruding upwardly from said base member and said head portion being flush with the underside of said base member and said head portion slidably engaging said lift arm structure of the vehicle lift, shaft means, said shank of said main pin means being provided with a transverse aperture receiving said shaft means with said shaft means being horizontally disposed, high step adapter pad means for selectively engaging structure of the vehicle and having a first pair of ears, and low step adapter pad means for selectively engaging structure of the vehicle and having a second pair of ears, said high and low step adapter pad means selectively supporting the weight of the vehicle and respectively having off center upright positions and reclined positions thereto, said first and second pairs of ears being provided with aligned apertures pivotally receiving said shaft means with said first and second pairs of ears straddling said main pin means with one of said pairs of ears being adjacent said main pin means and the other of said pair of ears being remote therefrom whereby said respective high and low step adapter pad means may selectively be pivoted about said shaft means between said off center upright positions and said reclined positions, said high step adapter pad means including first shoulder means for restingly engaging and rigidly supporting said low step adapter pad means in said off center upright position with the upper end of said low step adapter pad means engaging structure of the vehicle and having the weight of the vehicle resting thereon; said low step adapter pad means including second shoulder means for restingly engaging and rigidly supporting said high step adapter pad means in said off center upright position with the upper end of said high step adapter pad means engaging structure of the vehicle and having the weight of the vehicle resting thereon.

3,921,763

MOTOR DRIVEN HOIST DEVICE FOR SIMULTANEOUS LIFTING OF A CAGE GATE AND A GATE AT A STOPPING LEVEL

Tage Westerlund, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Sept. 24, 1973, Ser. No. 399,874

Claims priority, application Sweden, Sept. 25, 1972, 12331/72

Int. Cl.² B66B 13/12

U.S. Cl. 187—52 LC **5 Claims**

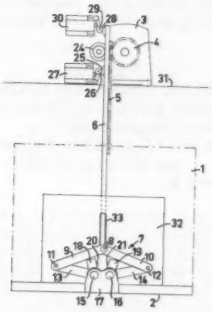
1. In a hoist arrangement which includes a hoist cage, a gate for the hoist cage, and a gate at a stopping level, the improvement which comprises a device for simultaneously raising the gate of the hoist cage and the gate at a stopping level which comprises in combination

a. motorized lifting means on said hoist cage for applying an upward lifting force,

b. lever members on said hoist cage,

c. connecting means interconnecting said lever members and said motorized lifting means,

d. a pair of opposed gripping members positioned on said hoist cage gate and being mounted so as to be movable from a non-gripping position wherein the gripping members are spaced apart as far as possible to a gripping position wherein said gripping members approach each other as closely as possible,



e. means interconnecting said lever members and said gripping members, and

f. a member on said stopping level gate that is positioned so that it is engageable between said gripping members when the gripping members are in their gripping position,

whereby when said lifting means exerts an upward force the lever members in turn cause said gripping members to change from a non-gripping position to a gripping position so that the gripping members will grip said stopping level member on said stopping level gate so that both said gate for the hoist cage and said gate for the stopping level adjacent the hoist cage will be raised simultaneously.

3,921,764

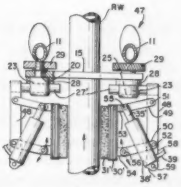
SELF-ENERGIZING BICYCLE BRAKE

William R. Mathauser, P.O. Box 5, Sun Valley, Idaho 83353

Filed July 25, 1973, Ser. No. 382,345

Int. Cl.² B62L 1/14

U.S. Cl. 188—24 **17 Claims**



1. A self-energizing bicycle brake, comprising a substantially inverted U-shaped mounting yoke connected to the frame of a bicycle and extending at its opposite ends on opposite sides of a rim of a wheel of the bicycle, a first brake block adjustment and support means on each end of the yoke for adjustment in a first direction substantially parallel to the plane of the wheel, said first adjustment and support means comprising an elongate slot in each end of the yoke extending substantially parallel to the plane of the wheel and a first pin extended through said slot for movement therealong, said first

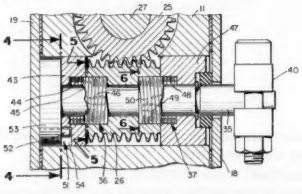
pin having an opening extending transversely therethrough, a second brake block adjustment and support means adjustably mounted to said pin for adjustment in a second direction substantially perpendicular to the plane of the wheel, said second adjustment and support means including a second elongate adjustment pin extended through the hole in the first pin for movement toward and away from the wheel, means for securing the second pin in adjusted position relative to the first pin, brake block means carried by said second pin for adjustment thereof in said first and second directions and for movement toward and away from the wheel rim into and out of braking engagement with the wheel rim, and actuating means connected with the brake block means to actuate the brake block means both in a direction toward the wheel and in the direction of travel of the wheel, whereby said brake is self-energizing upon engagement with the wheel rim.

3,921,765

AUTOMATIC BRAKE SLACK ADJUSTER

Kenneth D. Swander, Jr., Lawrence, Kans., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 19, 1974, Ser. No. 443,664
Int. Cl.² F16D *65/56*
U.S. Cl. 188—79.5 K **11 Claims**



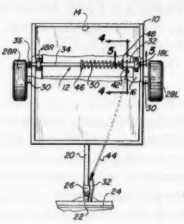
1. In a slack adjusting mechanism for vehicle brakes,
an actuating arm assemblage comprising a body portion and an elongate actuating arm integral with the body portion, a first bore in the body portion,
an internally splined first worm gear rotatably mounted in said bore and adapted to receive therethrough a brake-actuating cam shaft,
the actuating arm being adapted for connection with means for rocking the housing in application and release of the brake and the associated brake-actuating cam shaft,
a second bore in the body portion extending at right angles to the turning axis of the worm gear and opening at one end thereof into the first bore,
a connecting shaft rotatably mounted in the second bore and carrying a first worm thereon having driving connection through the first named opening with said first worm gear,
a third bore in the body portion extending acrosss the other end of the second bore and opening thereinto,
a second gear mounted on the connecting shaft with the threads thereof extending into the second named opening,
a drive shaft rotatably mounted in the third bore carrying a second worm thereon having driving connection with the second gear through the second mentioned opening,
a first clutch means communicating between said drive shaft and said second worm,
said first clutch means operable on rotation of said shaft in a first direction to couple the second worm and drive shaft together for rotation one with the other,
and on rotation of the shaft in the opposite direction to free the second worm and drive shaft for rotation of the latter without the former,
and a second clutch means communcating between said second worm and body portion,
said second clutch means operable on rotation of said drive shaft in said first direction to free the second worm and body portion from one another to permit rotation of the drive shaft and second worm together,
and on rotation of the drive shaft in the opposite direction to couple the second worm and body portion together whereby to prevent rotation of the second worm with the drive shaft.

3,921,766

TRAILER BRAKE

John May, Sturgis, S. Dak., assignor to May & Egger, Inc., Sturgis, S. Dak.

Filed Mar. 5, 1974, Ser. No. 448,229
Int. Cl.² B60T *13/04*
U.S. Cl. 188—167 **1 Claim**



1. A braking system for two-wheeled trailers having an axle with a righthand side and a lefthand side wheel comprising: a push rod mounted for reciprocating movement transversely of the trailer between a retracted inoperative position and an extended operative position, guide means sized to telescopically receive the push rod, said guide means and push rod including alignable apertures occupying a registered relation in the retracted inoperative position of the said push rod; spring means connected to the push rod normally urging said rod into extended operative position, a brakeshoe attached to the push rod for frictionally engaging only the righthand side wheel when said push rod is in extended operative position, retractable latch means connected to the push rod releasably latching said push rod in retracted inoperative position, said latch means comprising a pin detachably received within said alignable apertures when in register with one another, and latch-actuating means connected to the latch means and connectable to a towing vehicle, said means being operative upon separation of said trailer and towing vehicle to retract the latch pin releasing the push rod into extended operative position thereby braking the righthand side wheel and causing the trailer to turn aside from oncoming traffic.

3,921,767

WHEEL CYLINDER IN A DUAL HYDRAULIC BRAKE SYSTEM OF A VEHICLE

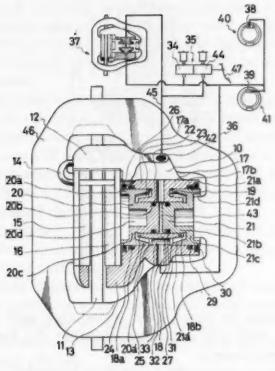
Masatada Yokoi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 234,144, March 13, 1972, abandoned. This application Feb. 14, 1974, Ser. No. 442,579
Int. Cl.² F16D *65/14*
U.S. Cl. 188—345 **8 Claims**

1. A wheel cylinder in a dual brake system, comprising;
a cylinder housing open at its opposing axial ends and having an outer larger diameter portion and a radially inwardly disposed smaller diameter portion;
two stepped pistons each having an outer larger diameter portion, the radially outer periphery of which is slidably engaged in sealed relation with the inner periphery of the larger diameter portion of the housing, and a radially inwardly disposed smaller diameter portion, the radially outer periphery of which is slidably engaged in sealed relation with the inner periphery of the smaller diameter portion of the housing;

a first pressure chamber constituted between the smaller diameter portions of said two pistons and the inner periphery of the smaller diameter portion of said housing and being fluidically connected to a first pressure source; and

a second pressure chamber constituted between each of said pistons and the housing and being fluidically connected to a second pressure source which is independent of the first pressure source;



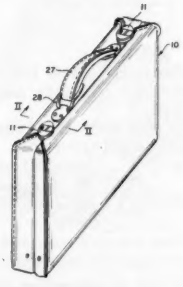
wherein the larger diameter portion of each piston includes a sleeve inwardly tapered on its radially inner surface, the smaller diameter portion of the housing includes a sleeve correspondingly outwardly tapered from each axial end thereof on its radially outward surface which overlaps the sleeve of each piston with an annular gap being provided therebetween, and the smaller diameter portion of the housing is formed integrally with the larger diameter portion thereof.

3,921,768

LUGGAGE CASE

Samson Gorky, New Castle, Pa., assignor to Airway Industries Inc., West Pittsburg, Pa.

Filed Feb. 13, 1974, Ser. No. 442,061
Int. Cl.² A45C *5/02*
U.S. Cl. 190—26 **5 Claims**



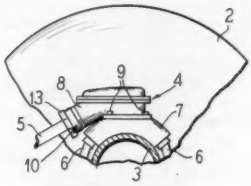
2. A luggage case comprising two complementary body shells hingedly connected together, characterized by a covering of relatively flexible sheet material fitted snugly over each body shell, each covering comprising an assembly of a main piece of octagonal contour and two end pieces the outer contour of which is partially congruent with the end contour of said main piece and stitching adjacent the congruent contours of the main piece and the two end pieces joining them together.

3,921,769

EXPLOSION-PROOF ELECTRICAL CABLE REEL CONNECTOR

Alan S. Walse, La Grange, and Donald J. Reed, Downers Grove, both of Ill., assignors to Akzona Inc., Asheville, N.C.

Filed July 17, 1974, Ser. No. 489,242
Int. Cl.² H02G *11/00*
U.S. Cl. 191—12 R **10 Claims**



1. An explosion-proof electrical cable reel connector of the type having a rotatable drum reeling means comprising:

plug and receptacle housing sections separably connected to one another in explosion-proof assembly,

said receptacle housing section being curved to a configuration generally complementary to that of the drum reeling means,

and said plug housing section having an angulated configuration forming a cable entrance portion disposed in generally tangential relation to the receptacle housing and a coupling portion disposed radially to the receptacle housing,

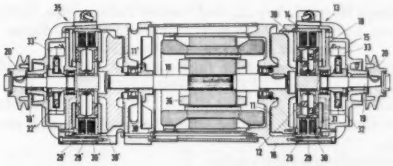
whereby the cable will be accepted in the natural lay or wrap of the cable around the reeling means.

3,921,770

ARRANGEMENT FOR DRIVING TWO OUTPUT SHAFTS

Heinz Daab, and Rudolf Kling, both of Darmstadt, Germany, assignors to Quick-Rotan Becker & Notz KG, Darmstadt, Germany

Filed May 22, 1974, Ser. No. 472,380
Claims priority, application Germany, May 23, 1973, 2326275
Int. Cl.² B60K *41/24;* F16D *13/22;* D05B *69/00*
U.S. Cl. 192—12 D **24 Claims**



1. A drive arrangement, comprising, in combination, a drive motor; first and second output shafts; first and second clutch means each operative when activated for establishing torque-transmitting engagement between said motor and a respective one of said first and second output shafts; first and second braking means for braking the rotary motion of respective ones of said output shafts; and negative-feedback control means operative when activated for maintaining the ratio of the rotary speeds of said first and second output shafts at a preselected desired value by alternately activating and deactivating at least one of said clutch means and at least one of said

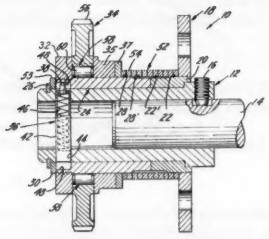
braking means in dependence upon the discrepancy between the actual value of said ratio and said desired value thereof.

3,921,771

CLUTCH FOR PROVIDING INTERMITTENT ROTARY OUTPUT FROM A SOURCE OF CONTINUOUS ROTARY POWER

Andrew Thomas Szabo, Euclid, Ohio, assignor to Marquette Metal Products Co., Cleveland, Ohio

Filed July 29, 1974, Ser. No. 492,635
Int. Cl.² F16D *67/02*
U.S. Cl. 192—12 BA **17 Claims**



1. A clutch for providing intermittent rotary output from a source of continuous rotary power comprising:
   a. fixed support structure;
   b. an input drum connected to said source of continuous rotary power and supported for rotation by said fixed support structure;
   c. an output drum supported for rotation relative to said input drum;
   d. detent means coacting with said input drum and output drum to intermittently engage said outer drum with said input drum and cause conjoined rotary movement of the output drum and input drum;
   e. brake means coacting with the output drum upon rotation thereof to arrest rotation of the latter after limited rotary movement of the output drum;
   f. said torque means including means for rotatively disengaging said input drum and the output drum upon cessation of rotation of the output drum by said brake means and thereby permitting said input drum to rotate relative to the output drum.

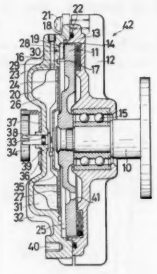
3,921,772

FLUID COUPLING

Masaharu Hayashi, Toyota, and Saburo Fujita, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Dec. 27, 1974, Ser. No. 536,793
Claims priority, application Japan, Dec. 27, 1973, 49-3980
Int. Cl.² F16D *35/00*, *43/25*
U.S. Cl. 192—58 B **5 Claims**

1. A fluid coupling for use with a fan-cooled engine comprising:
   a shaft driven by the engine;
   a circular rotor fixedly connected to and rotable with said shaft;
   a casing for supporting said shaft disposed on one side of said rotor and having cooling fins on the side remote from said rotor;
   a cover for said casing disposed on the side of said rotor remote from said casing being connected to said casing and having inner and outer cooling fins;
   a partition plate disposed between said cover and said rotor and defining therebetween a reservoir chamber on the cover side thereof and an actuating chamber on the rotor side thereof;
   a viscous fluid in the chambers in preselected amounts;
   said partition plate having an opening for transmitting fluid from said reservoir chamber to said actuating chamber;
   said rotor having an opening for transmitting said viscous fluid to said casing;
   said casing and said rotor having means disposed adjacent their respective mutually facing outer peripheries defining a labyrinth through which said viscous fluid is transmitted;



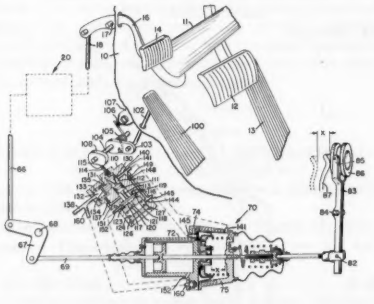
   passage means in said cover connecting said reservoir chamber and said actuating chamber for transmitting fluid therebetween;
   valve means for controlling said fluid transmitting opening in said partition plate; and
   temperature-responsive means outside said cover being connected to said valve means for opening and closing the fluid transmitting opening in said partition plate.

3,921,773

CLUTCH WITH SLACK TAKE UP AND RELEASE MOTORS

Howard H. Dietrich, 87 Commandor Parkway, Rochester, N.Y. 14625

Division of Ser. No. 262,236, June 13, 1972, Pat. No. 3,815,713. This application June 10, 1974, Ser. No. 477,594
Int. Cl.² F16D *25/08*
U.S. Cl. 192—83 **5 Claims**



1. In combination with an automotive clutch of the type having confronting operating surfaces which are normally engaged, and which are disengaged upon movement of an associated throw-out bearing from an inactive to an active position, an actuator device comprising
   a clutch pedal normally disposed in an inactive position, and movable manually toward an active position,
   means including an operating rod normally holding said throw-out bearing in an inactive position ,

fluid power operated means controlled by said pedal for shifting said operating rod from a first to a second position to effect movement of said bearing from its inactive to its active position, and including

a first member connected to said rod and movable, during the initial movement of said pedal toward its active position, a distance sufficient to shift said rod far enough toward its second position to take up any free play in the bearing holding means, and

a second member releasably connected to said rod and operative during further movement of said pedal to its active position to move said rod fully to its second position thereby to place the throw-out bearing in its active position,

control means operative, when said pedal has returned to its inactive position, initially to allow rapid return of said rod toward its first position, and then to slow down the rate of return of said rod as it approaches its first position,

said first and second members comprising a pair of pistons mounted to reciprocate coaxially with said rod in a pair of spaced chambers,

said rod being attaced to said bearing and to one of said pistons, means for selectively connecting said rod to the other of said pistons, and

said fluid power operated means including valve means interposed between said clutch pedal and said chambers, and operable by said pedal selectively to connect said chambers to a fluid pressure source for imparting motion to said pistons,

said valve means comprising a plurality or normally closed valves,

means including a cam operable by said initial movement of said pedal to open one of said valves, thereby to connect the chamber containing said one piston to said pressure source to effect movement of said one piston and said rod in unison said distance sufficient to take up the free play in said bearing holding means,

said cam being operable upon further movement of said pedal to open another of said valves to connect the other chamber containing said other piston to said pressure source to effect movement of said rod the remaining distance to its second position, and

said connecting means comprising releasable coupling means in said other chamber operative releasably to secure said other piston to said rod during the reciprocation of said other piston thereby to impart the motion of said other piston to said rod.

3,921,774
GEAR UNIT WITH DISCONNECT CLUTCH

Donald H. Hagen, 4213 61st Ave. No., Minneapolis, Minn. 55429

Filed Oct. 31, 1974, Ser. No. 519,610
Int. Cl.² F16D *25/08*
U.S. Cl. 192—85 CA **14 Claims**

1. A transmission unit including:

a. a housing having at least a pair of longitudinally spaced sides;

b. an input shaft extending into said housing through one side thereof and being bearingly mounted for rotation on said side;

c. bearing means on said other side of said housing and rotatably receiving the inwardly extending end of said input shaft;

d. at least one driving clutch plate carried by said input shaft for rotation therewith;

e. a longitudinally externally splined member rotatably received about said input shaft and longitudinally shiftable therealong;

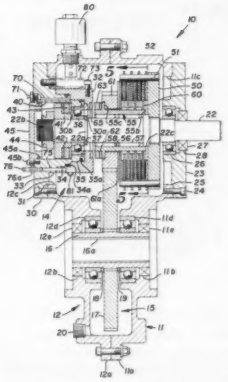
f. at least one driven clutch plate having splined connection to said splined member;

g. a first gear member carried by said splined member;

h. an output shaft and second gear rotatably mounted on the sides of said housing, said first and second gear being in constant mesh;

i. said driven clutch plate and said splined member being arranged in relation to said driving clutch plate for shifting thereof into and out of driven relation with said driving clutch; and,

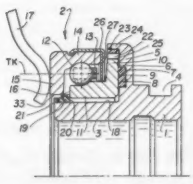
j. means for shifting said splined member and said driven clutch plate into driven relation with said driving clutch plate, said shifting means being arranged about the inwardly extending end of said input shaft.



3,921,775
SELF CENTERING CLUTCH RELEASE BEARING

Otto Matyschik, Nudlingen, Germany, assignor to SKF Industrial Trading and Development Co., Amsterdam, Netherlands

Filed Nov. 29, 1973, Ser. No. 420,145
Claims priority, application Germany, Dec. 9, 1972, 7245198
Int. Cl.² F16C *19/00, 33/30*
U.S. Cl. 192—98 **10 Claims**

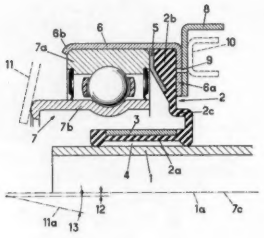


1. A self-centering radial clutch release bearing assembly comprising a supporting sleeve, an inner race ring mounted about said sleeve, an outer race ring and a plurality of anti-friction bodies located therebetween to rotate about said sleeve, one of said race rings being non-rotatable, at least one of said race rings having an annular shank extending therefrom beyond the pitch circle of rotation of said anti-friction bodies, said annular shank having an end lying opposite to a portion of said sleeve and extending in a direction parallel to the axis of said sleeve, and an elastic ring mounted between the end of said shank and said sleeve.

3,921,776
RESILIENTLY ALIGNED AND CENTERED CLUTCH RELEASE BEARING

Claude Sonnerat, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed Mar. 12, 1974, Ser. No. 450,517
Claims priority, application France, Mar. 27, 1973, 73.11001
Int. Cl.² F16D 13/60
U.S. Cl. 192—98 10 Claims

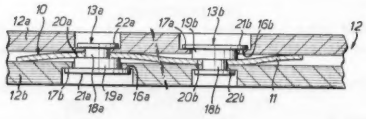


1. In a resiliently centered and aligned clutch release bearing assembly including an antifriction bearing having inner and outer races with rolling elements disposed therebetween and a resilient centering sleeve supporting said bearing, said sleeve being integrally formed from a flexible material adapted to be injection or compression molded, the improvement wherein said sleeve comprises radially inner and outer portions joined by a circular part in the form of a bellows deformable both axially and radially to permit both centering and aligning movement of said bearing during actuation of the clutch.

3,921,777
FRICTION DISC

Michel Rist, Boulogne Billancourt, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Nov. 27, 1973, Ser. No. 419,381
Claims priority, application France, Dec. 8, 1972, 72.43713
Int. Cl.² F16D 13/69
U.S. Cl. 192—107 C 4 Claims

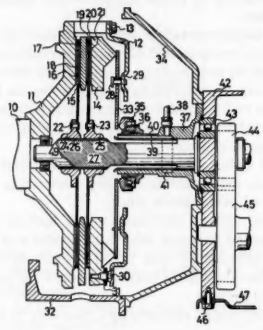


1. In a friction disc comprising a generally plane support having curved portions at its periphery resiliently flattenable upon a clamping action on the disc, friction linings disposed on opposite sides of said support and each lining being composed of only one layer of homogeneous material, rivets securing said linings to said curved portions, each said rivet having a first head and a shoulder clamping therebetween a portion of one lining and a said support curved portion and a second head defining an upper limit of the disc thickness; the improvement in which the other lining has a bearing surface against which the said second head abuts directly for defining said upper limit, said bearing surface being defined by an annular portion of the material of said other lining, said annular portion being of a thickness less than the thickness of said other lining.

3,921,778
VEHICLE WET-TYPE FRICTION CLUTCH

Teruo Sugiura, Toyota; Yujiro Takikawa, Nagoya; Hiroshi Miyamoto, Toyota, and Nobuyasu Ishida, Tokai, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Jan. 30, 1974, Ser. No. 438,015
Claims priority, application Japan, Feb. 24, 1973, 48-23826[U]
Int. Cl.² F16D 13/72
U.S. Cl. 192—113 B 3 Claims



1. In a vehicle wet-type friction clutch having a torque transmitting shaft, a disc clutch assembly axially and slidably mounted on said shaft by a spline coupling provided thereon, said disc clutch assembly having friction surfaces, a clutch release bearing having a bearing hub and a fixed bearing retainer for slidably supporting said bearing hub and mounted concentrically about said torque transmitting shaft, the improvement wherein said bearing retainer is provided with at least one axial groove on the inner surface thereof and comprises a sleeve member disposed coaxially within and fixed to said retainer and having an end portion extending toward the clutch beyond the outer end of said retainer to form at least one axial passage with said at least one groove, said end portion being flared outwardly toward said friction surfaces, and means for introducing cooling oil under pressure into the inner end of said at least one passage, the extended outer, flared end portion of said sleeve constituting a guide portion for directing the cooling oil generally radially outwardly toward said friction surfaces as it leaves the at least one passage.

3,921,779
COIN MECHANISM

Rune S. Pearson, 22625 Ellinwood, Torrance, Calif. 90505

Continuation of Ser. No. 271,173, July 12, 1972, abandoned.
This application Dec. 10, 1973, Ser. No. 423,054
Int. Cl.² G07F 5/00
U.S. Cl. 194—1 L 27 Claims

1. A coin mechanism comprising a housing having means for inserting coins therein, means for receiving and sorting the coins in accordance with their legal value,

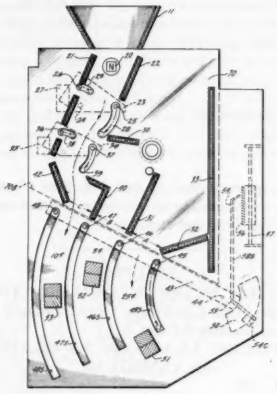
means for receiving the coins and producing increments of movement in accordance with the weight of the coins,

ratchet means coupled to said receiving means to be movable in response to the movement of the receiving means for totalizing same,

means for setting the starting point of the ratchet means in accordance with a desired total value of coins,

said ratchet means being movable to the same preselected location for each preselected total value of coins, and

manually operated means for sensing the arrival of the ratchet means at the same preselected location to release

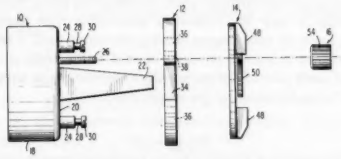


a controlled device only in response to the sensing of the arrival of the ratchet means at said preselected location.

3,921,780
ASSEMBLY FOR MOUNTING A PRINT HEAD

Richard V. Gentzlinger, and Werner H. Mailer, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed July 18, 1974, Ser. No. 489,599
Int. Cl.² B41J *3/05*
U.S. Cl. 197—1 R **16 Claims**



1. In combination, an assembly comprising:

a. a print head including an outer mounting member having at least two mounting studs and screw means connected thereto and extending outwardly therefrom;

b. a carriage including openings formed therein for the passage therethrough of said mounting studs and said screw means;

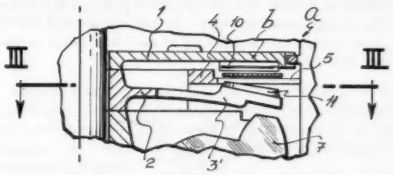
c. a mounting clamp including slots formed therein for the passage therethrough of said mounting studs and said screw means after passage through said carriage openings, with the slots through which said mounting studs pass including ramp means at one end thereof, ratchet means having a resilient free end portion and motion applying means for moving said mounting clamp between a release position and a lock position; and

d. a lock element which engages said screw means and the resilient free end portion of said ratchet means, and prevents the movement of said mounting clamp from said lock position to said release position.

3,921,781
HAND LABELLING DEVICE

Francisco Barcelloni Corte, Ruta Panamercana Kilm, 26, 300, Garin, Province of Buenos Aires, Argentina

Continuation-in-part of Ser. No. 287,984, Sept. 11, 1972, Pat. No. 3,774,744, which is a continuation-in-part of Ser. No. 173,456, Aug. 20, 1971, Pat. No. 3,704,771. This application Nov. 16, 1973, Ser. No. 416,396
Claims priority, application Argentina, Jan. 25, 1973, 246288
Int. Cl. B41j *1/30*
U.S. Cl. 197—6.7 **5 Claims**



1. In a device for imprinting characters on a belt, said device being of the type which includes a body, a lever pivotally carried on said body, a rotatable, substantially rigid member, having a first set of characters for use in imprinting selected characters on said belt, a second rotatable member coaxial with and non-rotatable relative to said first rotatable member, said second member having a plurality of flexible arms with characters on said arms and movable into cooperating relationship with each of said first set of characters for imprinting selected characters on said belt, said lever selectively moving each of said flexible arms into action for imprinting a selected character on said belt, the improvement comprising means for guiding said belt to an imprinting position, intermediate said first and second members, a housing for storing a length of said belt, and being removably secured to said belt guiding means, said belt passing to said imprinting position for imprinting characters on said belt, from said housing upon passage from said guiding means, cooperating knife defining means on said first and second members for at least partially severing said belt at a preselected time in response to pivoting of said lever relative to said body, said knife defining means including a blade on said rigid member and a back-up means for said blade on one of said flexible arms, said lever forcing said back-up means towards said blade with said belt therebetween, said guiding means positioning one edge only of said belt laterally away from said blade whereby said belt is severed for its entire width except for said one edge, said blade and said back-up means being the sole parts of said device contacting said belt during said severing operation at said severing position.

3,921,782
PRINTING CONTROL DEVICE FOR A TYPEWRITER

Toshiaki Kunishima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1974, Ser. No. 443,221
Claims priority, application Japan, Feb. 27, 1973, 48-23591
Int. Cl.² B41J *23/04*
U.S. Cl. 197—18 **10 Claims**

1. A printing control device comprising:

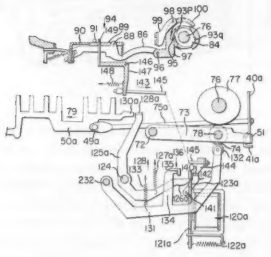
a printing element having a plurality of characters on the outer periphery thereof and operable to selectively present any desired character at a printing position;

a plurality of latch lever means for controlling displacement of said printing element to select one of the characters on said printing element, said latch lever means being connected to said printing element through at least one transmission mechanism, and said latch lever means each

taking a first position which is normal and a second position which is selectively taken, thereby to control the displacement of said printing element in accordance with a combination of the positions of said latch lever means and through the transmission mechanism, and said latch lever means each having a latch at one end thereof;

bail means engageable with the latches of said latch lever means to shift, to the second position, said latch lever means engaged with said bail means through the latch thereof;

a plurality of interposer means provided for said latch lever means, respectively, to selectively release the engagement between said latch lever means and said bail means; said interposer means taking an inoperative position which is normal and an operative position for releasing the engagement between said bail means and the latch lever means corresponding to said interposer means at the operative position;



a plurality of lever means provided for said interposer means, respectively, said lever means being urged by at least one urging means to urge said interposer means to the operative positions thereof, and said lever means each having a pawl member;

engaging means engageable with the pawl members of said lever means, said engaging means restraining, at the normal conditions thereof, the urging of said interposer means to the operative position thereof, and said engaging means, when operating to selectively release the engagement between the engaging means and the pawl members, causing the corresponding lever means to urge said interposer means to the operative position thereof;

a plurality of actuating means for causing said engaging means to be selectively released from engagement with said pawls; and

at least one resetting bar means for resetting said lever means, released from said engaging means, to engage said lever means with said engaging means against the urging means, said bar means being provided for said lever means and being cooperable with said bail means.

3,921,783

TYPEBAR ASSEMBLY

Aaron C. Zeamer, Cortland, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,347

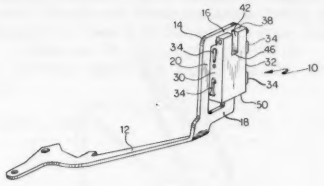
Int. Cl.² B41J 1/04

U.S. Cl. 197—36 **11 Claims**

1. A changeable type element carrying a type character on one face thereof for selective attachment to a yokeshaped distal end of a typebar having a pair of arms, the type element comprising:

a first groove formed in another face of said type element for receiving and confining at least a portion of one of the arms of said yoke-shaped distal end; and

co-acting means including an aperture formed in a face opposite said first groove having confined therein, a resilient biasing member, said aperture for receiving a portion of another of said pair of arms for abutting and compressing said resilient member for urging said type element



into engagement toward said one arm when said type element is disposed in an operative position on said distal end intermediate the arms thereof.

3,921,784

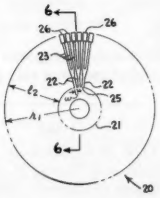
PRINTING DISC HAVING BIFURCATED TYPE ARMS

Alfreds Orlens, Old Greenwich, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 15, 1974, Ser. No. 451,344

Int. Cl.² B41J 1/32

U.S. Cl. 197—54 **3 Claims**



1. A rotative printing disc for use in a high speed serial printer, said printing disc adapted to be rotatively movable so as to be indexed to any one of several select print positions; said printing disc comprising a central hub portion and a plurality of arms carried by, and substantially radially extending from, said hub portion; each of said arms being bifurcated to provide a pair of outwardly extending type supporting fingers, each of said fingers having an outer end; a separate type element mounted on each of said outer ends; and each finger of each pair of the outwardly extending type supporting fingers being longer than its respective arm.

3,921,785

CONVEYOR MEANS FOR CROP GATHERING EQUIPMENT

Gary W. Hultink, North Little Rock, Ark., assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 209,262, Dec. 17, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,355

Int. Cl.² B65G 65/00

U.S. Cl. 198—8 **1 Claim**

1. A crop gathering mechanism comprising,

an elongated platform means having a bottom wall and a back wall means extending upwardly therefrom, said platform means having first and second ends,

first and second spaced apart wheels rotatably mounted on said bottom wall at an angle thereto, said wheels being positioned forwardly of said back wall,

a flexible member extending around and between said wheels,

power means for rotating one of said wheels to drive said flexible member,

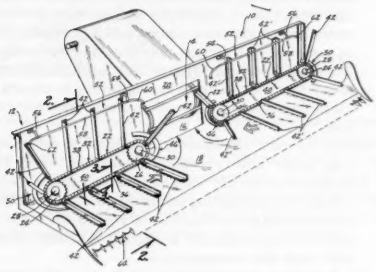
a plurality of paddle arms secured to said flexible member in a spaced apart relationship adapted to move along said

bottom wall along the length of said platform means to convey crop along said bottom wall; said paddle arms being angularly disposed to said flexible member,

means rigidly fixing the paddle arms to the flexible member for maintaining a fixed position of the paddle arms relative to the flexible member to enhance the pitching action of said paddle arms on material conveyed thereby,

said platform means being mounted on a combine header, said header having a crop elevating conveyor means extending upwardly and rearwardly from said back wall, said second wheel being positioned adjacent said elevating conveyor means,

a first cam guide means on said platform means between said second wheel and said elevating conveyor means adapted to engage the paddle arms to guide said paddle



arms upwardly and rearwardly from said bottom wall to convey the crop towards said elevating conveyor means, a guide rail means positioned on said back wall between said wheels said guide rail means being spaced forwardly of said back wall and being adapted to receive the paddle arms between said guide rail means and said back wall during the return portion of the travel of said flexible member,

said first cam guide means has a lower end positioned closely adjacent said bottom wall and said second wheel, said cam guide means being truncated conical and extending upwardly and rearwardly from its lower end and thence upwardly and laterally towards said first wheel,

each of said paddle arms comprising an elongated angle member.

3,921,786

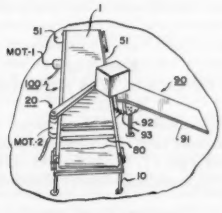
CONVEYER SORTER APPARATUS

Henry P. Hejmanowski, Steger, Ill., assignor to A W & H Manufacturing Co., Inc., Worth, Ill.

Continuation of Ser. No. 147,482, May 27, 1971, abandoned. This application Mar. 11, 1974, Ser. No. 449,681

Int. Cl.² B65G 47/42

U.S. Cl. 198—38 **10 Claims**



1. A conveyor apparatus for transporting articles to predetermined delivery stations comprising:

transport means having an upper surface for supporting and moving an article in a path of movement; and

intercept means including a tapered wedge-shape diverting member pivoted at one end adjacent said transport means with the free end thereof actuable in a path of movement parallel to the upper surface of said transport means to sweep an article moving in said path of movement therefrom in a continuous flowing path of movement, and

actuating means coupled to said diverting member for selectively sweeping the diverting member in a unidirectional rotation of a substantially 360° arcuate path about the pivoted end from an initial position out of the path of movement of the transport means along the direction of travel of said transport means to a position to sweep an article and returning to said initial position in a continuous movement.

3,921,787

HIGH SPEED TYPE POSITIONING MECHANISM

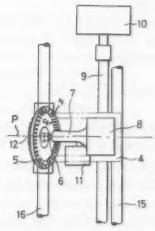
Bunzo Fujio, Hanamaki; Yasushi Sasaki, Iwate; Hiromi Takata, and Syoji Yanagida, both of Hanamaki, all of Japan, assignors to Yamura Kabushikikaisha Shinko Seisakusho, Hanamaki, Japan

Filed Nov. 29, 1974, Ser. No. 528,470

Claims priority, application Japan, Dec. 3, 1973, 48-136339

Int. Cl.² B41J 1/32

U.S. Cl. 197—53 **1 Claim**

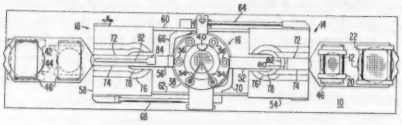


1. A high speed type element positioning mechanism, comprising a type head member having therein a plurality of type elements, a type head shaft on which said type head is mounted, the type head member having a spherical surface thereon through which the axis of said type head shaft extends, said type elements being mounted in said type head member with the faces thereof on said spherical surface and movable in said type head member for being projected beyond said spherical surface, said type elements lying along latitudinal circles on said surface the centers of which lie on the axis of said type head shaft, the type elements in adjacent latitudinal circles being substantially aligned along longitudinal circles extending from the point of intersection of said type head shaft axis and said spherical surface, said type head shaft being pivotally mounted for pivotal movement around a point corresponding to the center of the sphere of which said spherical surface forms a part, a type hammer positioned adjacent said type head for striking a type element for projecting it beyond said sperical surface for carrying out a printing action and lying in a plane with the axis of said type head shaft, a first drive means coupled to said type head shaft for rotating said shaft in response to a signal corresponding to a character to be printed for rotating said type head member for aligning the type member corresponding to the character to be printed in the plane with said type hammer, and a second drive means coupled to said type head shaft for pivoting said type head shaft in said plane for aligning a type element in one of said circles with said type hammer.

3,921,788
PROCESSING APPARATUS FOR THIN DISC-LIKE WORKPIECES

Glenn A. Roberson, Jr., San Jose; Robert I. Beaver, II, Menlo Park, and Edward L. Kelly, Sunnyvale, all of Calif., assignors to Macronetics, Inc., Mountain View, Calif.

Filed May 21, 1974, Ser. No. 471,872
Int. Cl.² B65G *1/06, 25/04, 47/06*
U.S. Cl. 198—19 **14 Claims**



9. Apparatus for transporting thin workpieces to and from a workpiece processing area comprising:

a first slide for receiving a workpiece thereon to be processed;

a receptacle for holding said thin workpieces in a vertical stack, where each workpiece is horizontally oriented and spaced-apart from adjacent workpieces;

means for incrementally lowering said receptacle to deposit workpieces on said first slide;

means for moving said first slide to transport said workpiece thereon to an intermediary position;

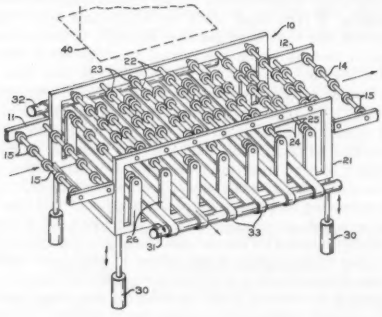
a second slide; and

means for moving said second slide mechanism to transport said workpiece from said intermediary position to the workpiece processing area.

3,921,789
METHOD AND APPARATUS FOR TRANSFERRING ARTICLES FROM A CONVEYOR

John A. Goldinger, Boiling Springs, Pa., and Dwight R. Peterson, Burkburnett, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 8, 1974, Ser. No. 440,898
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B65G *47/26*
U.S. Cl. 198—31 AB **27 Claims**



1. An apparatus for transferring articles in a transverse direction from a generally horizontal main line conveyor upon which said articles are being conveyed at close intervals, without interrupting said conveying, comprising:

a vertically movable frame supporting a generally horizontal lower conveyor section and a generally horizontal upper conveyor section overlying and vertically spaced from said lower conveyor section; each of said upper and lower conveyor sections including means to convey an article in one given direction;

means for vertically moving said frame to selectively align said upper conveyor section and said lower conveyor section with an elevation corresponding to the elevation of a main line conveyor;

means for transporting an article off one of said conveyor sections in a direction transverse to said given direction when the other of said conveyor sections is aligned with said elevation of a main line conveyor.

6. A conveyor system comprising:

a generally horizontal main line conveyor having means for conveying articles in a given direction;

at least one work station laterally displaced from said main line conveyor;

a vertically movable frame interposed between upstream and downstream main line conveyor sections adjacent to said work station, said frame supporting a generally horizontal lower conveyor section and a generally horizontal upper conveyor section overlying and vertically spaced from said lower conveyor section; each of said upper and lower conveyor sections having means to convey an article in the same given direction as said main line conveyor; and

means for vertically moving said frame to selectively align said upper conveyor section and said lower conveyor section with the elevation of said main line conveyor; and means for transporting an article off one of said conveyor sections and toward said work station when the other of said conveyor sections is aligned with said elevation of said main line conveyor.

13. A method of transferring articles toward a transversely displaced work station from a main line conveyor upon which said articles are being horizontally conveyed at close intervals comprising the steps of:

a. aligning a first conveyor section between upstream and downstream portions of the main line conveyor so as to provide a continuous path for conveyance of articles therebetween;

b. stopping a selected article on said first conveyor section;

c. vertically translating said first conveyor section out of alignment with said main line conveyor portions, and aligning a second conveyor section with said main line conveyor portions in place of said first conveyor section so as to restore the continuous path for conveyance of articles therebetween;

d. transferring said selected article from said first conveyor section in a direction transverse to said main line conveyor, and at the same time conveying a subsequent article from said upstream portion to said downstream portion of the main line conveyor by way of said second conveyor section;

e. vertically translating said first and said second conveyor sections so as to return said first section into alignment with said main line portions and to remove said second section from alignment with said main line portions; and

f. repeating the sequence of steps (a) through (e) for each article to be transferred, whereby transfers from the main line are accomplished without affecting the continuous conveying of articles along the main line conveyor.

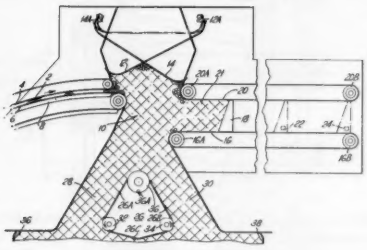
3,921,790
CONVEYING OF CIGARETTES AND OTHER ROD-LIKE ARTICLES

Dennis Hinchcliffe, and Peter Alec Clarke, both of London, England, assignors to Molins Limited, London, England

Filed Apr. 17, 1973, Ser. No. 351,924
Claims priority, application United Kingdom, Apr. 21, 1972, 18510/72
Int. Cl.² B65G *43/08*
U.S. Cl. 198—37 **41 Claims**

1. A cigarette tray handling machine including means defining a junction zone; means defining a delivery channel for

receiving a stack of cigarettes from said junction zone, said delivery channel having a width sufficient to accommodate a plurality of cigarettes in side-by-side relation; means for delivering cigarettes into the junction zone; and a reservoir comprising a conveyor for carrying a stack of cigarettes into or from the junction zone as required, and means for continuously driving the conveyor at a first predetermined speed while moving in one direction and at a second predetermined speed while moving in the opposite direction, so that the reservoir absorbs or discharges cigarettes at the full rate at which the machine is capable of handling cigarettes while each tray is being replaced by the next tray, and discharges or absorbs the cigarettes at other times at a slower speed.



3,921,791

CONVEYOR SYSTEM FOR SIDEWISE TRANSPORT OF CIGARETTES OR THE LIKE ALONG ARCUATE PATHS

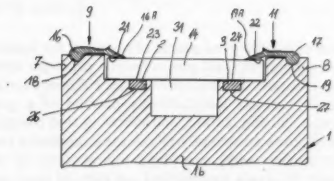
Ulrich Bornfleth, and Fritz Selonke, both of Hamburg, Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed June 26, 1973, Ser. No. 373,663

Claims priority, application Germany, July 5, 1972, 2232960

Int. Cl.² B65G *15/14, 47/74*

U.S. Cl. 198—165 **11 Claims**



1. Apparatus for transport of cigarettes or analogous rod-shaped articles having a predetermined diameter, comprising first transporting means including a first endless conveyor arranged to move in a predetermined direction and having at least one first article-engaging and advancing surface located at a first side of an elongated path for sidewise movement of rod-shaped articles therealong; second transporting means including a second endless conveyor arranged to move in said predetermined direction and comprising an endless flexible element having an elastic first endless marginal portion provided with a second article-engaging and advancing surface located at a second side of said path opposite said first side and a second endless marginal portion, at least a portion of said path being curved and one of said surfaces being convex in the region of said curved portion of said path, the other of said surfaces being concave in the region of said curved portion of said path; and positioning means for guiding said second marginal portion of said flexible element so that the distance between said first and second sides of said path in the absence of articles between said surfaces is not appreciably less than and at most equals said predetermined diameter, said elastic first marginal portion of said flexible element biasing the articles in said path against said first surface.

3,921,792

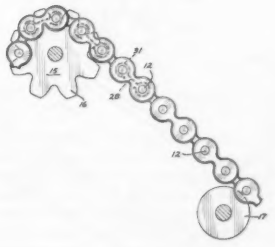
FLEXIBLE LINK CONNECTING STRUCTURE FOR CONVEYOR

William S. Anderson, deceased, late of Moses Lake, Wash., and by Marietta H. Anderson, heir, 4504 Fairchild Lane, Moses Lake, Wash. 98837

Filed Nov. 5, 1973, Ser. No. 412,582

Int. Cl.² B65G *17/08*

U.S. Cl. 198—189 **9 Claims**



1. An endless conveyor structure having in combination sprockets comprising driving means,

a conveyor comprising parallel spaced rods engaged and driven by said sprockets,

a connecting member for each adjacent pair of end portions of said rods,

each of said connecting members comprising

a pair of spaced body portions,

each of said body portions having a bore therethrough of lesser diameter than the diameters of said rods, said body portions being sufficiently resilient to receive said rod end portions within said bores for a pressure-tight non-rotative fit therein,

a flexible web integral with said body portions forming a hinge therebetween, and

resilient reinforcing means embodied within said connecting member.

3,921,793

REVERSIBLE BELT TENSIONING SYSTEM

Richard H. Hutchinson, deceased, late of Philadelphia, Pa., and by Claire T. Hutchinson, executrix, Philadelphia, Pa., assignors to Sigmund Goodman, Toronto, Canada and Elliot L. Goodman, Philadelphia, Pa., part interest to each

Filed July 8, 1974, Ser. No. 486,420

Int. Cl.² B65G *15/30*

U.S. Cl. 198—208 **3 Claims**

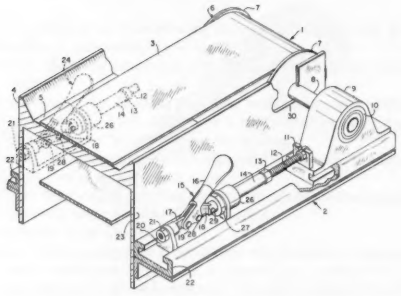
1. A reversible belt tensioning system for releasably securing an endless belt to a rotational roller, comprising:

a. a frame member having a pair of transversely displaced side walls extending in a longitudinal direction normal said transverse displacement;

b. toggle actuation means mounted to said frame member, said toggle actuation means fastened to said bearing block means for linearly displacing said bearing block means in said longitudinal direction, said toggle actuation means including:

1. a toggle frame rigidly secured to said mounting means within a longitudinally directed channel formed within said mounting means;

2. linkage actuation means pivotally fastened to said toggle frame, said linkage actuation means including,
   a. a rotational lever having a first and second pivot point, said lever being rotational in a plane coincident with said longitudinal direction, said lever being pivotally mounted to said toggle frame at said first pivot point; and,
   b. a bar link pivotally mounted to said rotational lever second pivot point on a first end thereof and to said toggle displacement means on a second end thereof, said bar link for converting rotational motion of said rotational lever to longitudinal motion of said displacement means; and
3. toggle displacement means slidably moveable in restrained linear longitudinal motion with respect to said toggle frame, said toggle displacement means being connected on opposing ends thereof to said linkage



actuation means and said bearing block means respectively, and including adjustment means for maintaining a predetermined longitudinal displacement between said toggle frame member and said bearing block means; and,

c. bearing block means moveable with respect to said frame member in said longitudinal direction said bearing block means secured to said rotational roller for displacement of said roller in said longitudinal direction responsive to said movement of said bearing block means, said bearing block means being longitudinally aligned with said toggle frame and being slidably moveable within said channel of said mounting means; and
d. means for mounting said bearing block means and said toggle actuation means to said frame member said bearing block means being moveable in said longitudinal direction with respect to said mounting means.

3,921,794

APPARATUS FOR TREATMENT OF MATERIAL IN A CHANNEL

Sven Gustav Casselbrant, Lidingo, Sweden, assignor to Sven Casselbrant & Co., Lidingo, Sweden

Filed Mar. 13, 1974, Ser. No. 450,609

Claims priority, application Sweden, Mar. 16, 1973, 7303755

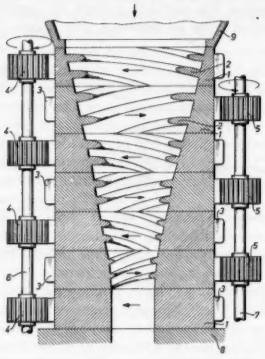
Int. Cl.² B65G *33/00*

U.S. Cl. 198—215 **6 Claims**

1. Apparatus for treatment of material, comprising:

a plurality of sequentially and co-axially arranged, rotatable, annular units (1), the central openings of said annular units being substantially aligned to form an elongate material treating channel (10) having an inlet and an outlet;

at least one helical vane (2) provided on the inner surface of each of at least two of said annular units (1), each helical vane (2) having a predetermined screw direction, the screw directions of the said helical vanes being reversed from unit to unit in said sequentially arranged annular units; and



means (3–7) external of said channel (10) for rotating annular units with vanes having different screw directions in opposite directions.

3,921,795

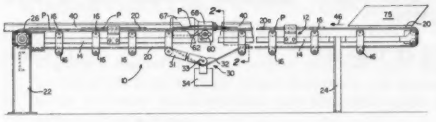
TIRE PLY STOCK EDGE ALIGNMENT

Leonard A. Vandale, Akron, and James A. Obermeier, Clinton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 18, 1973, Ser. No. 352,367

Int. Cl.² B65G *47/24*

U.S. Cl. 198—256 **9 Claims**



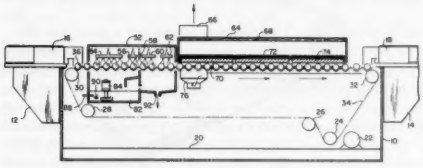
1. A method of handling cut pieces of ply stock for building tires comprising receiving said pieces from a ply stock cutter on a movable transport surface, moving said transport surface and said pieces together longitudinally parallel to a guide surface toward a splicing station, and vibrating said transport surface intermittently sufficiently to release said pieces from said transport surface while exerting a lateral force on said pieces sufficient to urge a longitudinal cut edge of each such piece into aligning contact with said guide surface, to align said pieces with respect to a common longitudinally extending line for subsequently joining the so aligned pieces in end-to-end relation.

8. An apparatus for transporting cut pieces of tacky ply stock for building tires and for realigning said pieces to common longitudinal alignment with one another comprising a longitudinally extending planar transport surface extending between a ply stock cutter and a ply stock splicing station to receive cut pieces of such stock one at a time thereonto from said cutter and for transporting them in end-to-end sequence toward said splicing station, a single alignment guide extending normal to said surface and parallel to the direction of movement of said end-to-end sequence and adjacent to one longitudinal edge of said surface, vibrator means operable to vibrate said surface normal to its width and length sufficiently to reduce the effect of the tack between said ply stock and said surface, and means for inducing lateral movement of said pieces tending to move them laterally toward said single guide.

3,921,796
METHOD OF CONVEYING ROUND WAFERS

Hendrik Frederik Bok, Fairhaven, and Eugene Raymond St. Onge, E. Freetown, both of Mass., assignors to In-Line Technology, Assonet, Mass.

Filed June 15, 1973, Ser. No. 370,516
Int. Cl.² B65G 47/24
U.S. Cl. 198—266 2 Claims



1. Method of conveying wafers of the type comprising thin discs having two circular and parallel sides comprising the steps of:

A. supporting each of said wafers in a vertical attitude and conveying said wafers within a vertical plane, such that each of said circular and parallel sides are aligned parallel to said plane of conveying; and

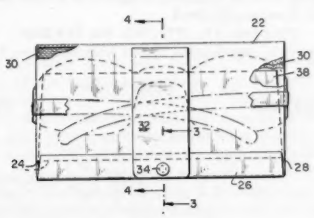
B. rotating each of said wafers upon an axis which is transverse to and perpendicular to said plane of conveying, such that each of said wafers is turned while being conveyed and maintained in said alignment with said plane of conveying, while

C. advancing said wafers through a longitudinal sector wherein said steps of supporting, rotating and advancing further comprise supporting and advancing each of said wafers at three points contacting a lower segment of said circular peripheries of said rotating wafers and rotating each of said wafers through contact with the middle of said three points.

3,921,797
DISPOSABLE GLASSES CASE

Sidney S. Platt, 300 W. Douglas, Wichita, Kans. 67202

Filed July 9, 1973, Ser. No. 377,638
Int. Cl.² A45C 11/04
U.S. Cl. 206—5 4 Claims



1. A disposable eyeglasses case and eyglasses comprising, in combination:

a. eyeglasses having temple members,

b. a sheet of pliable material, said sheet including a first end portion and a second end portion, said first end portion being flanged to form a pocket having attached therein a multiplicity of disposable tissues, and

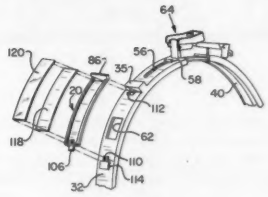
c. means attached to said sheet for essentially holding the edge of said second end portion in proximity and registry with the edge of said first end portion when said sheet is folded to form an eyeglasses storage pocket,

said sheet folded and said eyeglasses mounted in said last named pocket with said disposable tissues between said sheet and the front of said eyeglasses, another and opposite portion of said sheet to the back of said eyeglasses, and said temple members in retracted position.

3,921,798
CARTRIDGE LABEL HOLDER

Carl J. Dean, Charlton, and Bernard T. Cournoyer, Holden, both of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed May 6, 1974, Ser. No. 467,408
Int. Cl.² B65D 85/67, 85/02
U.S. Cl. 206—53 8 Claims

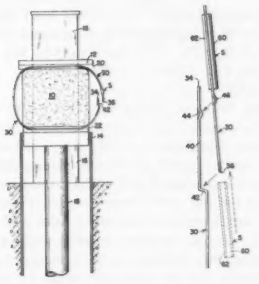


1. The combination of a protective reel cover assembly and a label card holder, said reel cover assembly comprising a resilient split ring band for encasing the periphery of a tape reel and toggle means connected to the ends of said split ring band for selectively expanding or contracting said band so as to selectively place said band in non-clamping or clamping relation to a tape reel, said band also having a pair of spaced slots and a tape access aperture located between said slots, said label card holder comprising an elongate body and a pair of retaining tabs located at opposite ends of said body, said elongate body extending over and concealing said tape access aperture and said tabs extending into said slots and interacting with said band to retain said label holder on said band, said elongate body comprising a top surface facing away from said band for supporting a label card and side walls at opposite sides of said top surface having grooves for slidably receiving and interlocking with the edges of the label card.

3,921,799
FIXED LENGTH LOOP-FORMING STRAP AND OVERLAP JOINT THEREFOR

William A. Meier, Hoffman Estates, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Aug. 16, 1974, Ser. No. 497,867
Int. Cl.² B65D 71/00, 63/06
U.S. Cl. 206—83.5 8 Claims

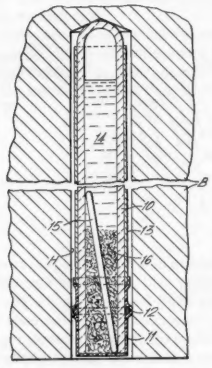


4. In a baling installation, the combination set forth in claim 7, wherein said protuberance and recess are established by the provision of nested outstruck bosses on the offset and upper end region respectively.

3,921,800
CAPSULE FOR USE IN FIXING ROCK-BOLTS

Donald Anthony Burns, Potters Bar, England, assignor to Cementation Chemicals Limited, Surrey, England

Filed Oct. 26, 1973, Ser. No. 410,026
Claims priority, application United Kingdom, Feb. 28, 1973, 9787/73
Int. Cl.² B65D *81/32*
U.S. Cl. 206—219 1 Claim



1. A capsule for use in fixing a bolt in a masonry mass, comprising a substantially rigid frangible phial body, hardenable compound in an unhardened state within said phial body, at least one hardener substance within said phial body and isolated therein from said hardenable compound, an elastomeric ring surrounding said phial body and spaced from an open end of said phial body, a metal shield surrounding said phial body and a cap made of membranaceous material shrunk upon said phial body and closing said end thereof in a leak-proof manner, a sleeve portion of substantial length of said cap surrounding and gripping said elastomeric ring in place upon said phial body and thereby producing a resilient annular bulge spaced from said end of said phial body, said cap having a marginal portion surrounding and gripping a marginal portion of said shield and gripping said shield in place upon said phial body.

3,921,801
SELF-CONTAINED MOLDING KIT FOR HEAT-LIQUIFIABLE MOLDING MATERIAL

Boris Sway, 7201 W. Aracoma Drive, Cincinnati, Ohio 45237

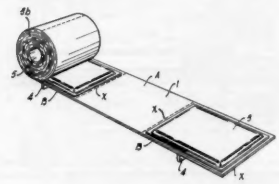
Filed Jan. 30, 1975, Ser. No. 545,365
Int. Cl.³ B28B *7/00*; B65D *69/00*
U.S. Cl. 206—223 8 Claims

1. A molding kit comprising a substantially cylindrical, elongate container open at one end and closed at its other end, a quantity of heat-liquifiable molding material housed within said container, and a closure member securely, though releasably, secured to the free open end of the container for enclosing the contents thereof, said closure member having peripheral side walls which project outwardly from and completely circumscribe a central portion having indicia embossed therein, said container fabricated from material adapted to withstand the application of heat sufficient to liquify the molding material in the container, said closure member when removed from the container and inverted defining a mold adapted to receive and contain the heat-liquified molding material from the container for providing a mirror-image of the indicia of the mold, which image is reproduced in said material as it cools and hardens in the mold.

3,921,802
MOIST/DRY LAVATORY AND TOILET TISSUE

Joseph Ausbon Thompson, 301 NE. 11th St., Oklahoma City, Okla. 73104

Filed July 19, 1973, Ser. No. 380,544
Int. Cl.² B65D *69/00*, *85/671*, *85/675*
U.S. Cl. 206—225 4 Claims

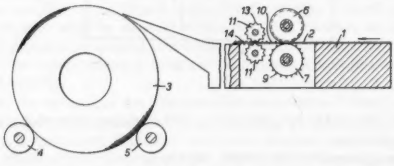


1. A cleansing lavatory and toilet paper product comprising a continuous strip having a plurality of moist and dry sections connected in end-to-end alternating sequence; said strip having lines of weakness respectively interposed between the sections forming tear lines whereby the even separation of the sections from the strip is facilitated; each said moist section comprising a top tissue cover and a bottom tissue cover, each treated on one surface with a water-proofing substance and connected peripherally to each other, wherein the waterproof surfaces are face to face, so as to effect a waterproof space compartment therein between; a fibrous moist pad impregnated with liquid being interposed and sealed therein between said covers inside the waterproof space compartment and connected to one side of said compartment, the other side of said compartment being separable from the moist section at the peripheral connection to expose the unconnected surface of the fibrous moist pad for cleansing applications; there being a tab connected to the outside surface of one side of the moist section to facilitate holding said moist section while it is being used; each moist tissue section being connected at the tear lines at its end points to a dry tissue section at each end.

3,921,803
COIL PACKAGING, METHOD AND APPARATUS FOR FORMING SAME

Geoffrey Ronald Reed, Ham, and Barry Edward Knox, New Addington, both of England, assignors to British Steel Corporation, London, England

Filed Oct. 31, 1974, Ser. No. 519,588
Claims priority, application United Kingdom, Nov. 15, 1973, 52989/73
Int. Cl.² B65D *85/66*
U.S. Cl. 206—389 25 Claims



1. A method of packaging a coil of strip material comprising the steps of feeding a sheet-like member of stiff protective material towards the circumference of the coil; corrugating each longitudinal edge of the protective material; wrapping the protective material around the outer circumference of the coil so that the corrugated edges of the protective material define axially outwardly directed overhanging projections around the outer circumferential edge at each end of the coil and deforming the overhanging corrugated edges of the protective material radially inwardly over the outer circumferen-

tial edge at each respective end of the coil to overlie partially the axial face of each end of the coil.

9. A packaged coil of strip material wherein a sheet-like member of stiff protective material is wrapped around the outer circumference of the coil, the protective material having corrugations in each longitudinal edge thereof at the outer circumferential edge respectively at each end of the coil and said corrugated edges being deformed radially inwardly to overlie partially the respective axial face of each end of the coil.

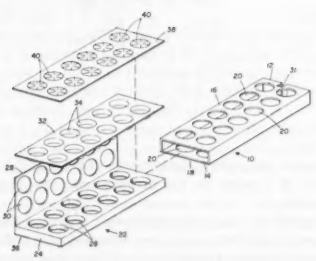
18. Apparatus for use in packaging a coil of strip material comprising means for wrapping a sheet-like member of stiff protective material around the outer circumference of the coil, the width of the protective material being greater than the axial dimension of the coil whereby an axially outwardly directed overhanging projection of protective material is provided at the outer circumferential edge at each end of the coil; means for imparting a series of corrugations to the longitudinal edges of the material before it is wrapped around the coil and means for deforming the overhanging corrugated edges of the protective material radially inwardly over the outer circumferential edge at each respective end of the coil to overlie partially the axial face of each end of the coil.

3,921,804

MEDICATION DISPENSING PACKAGE

William W. Tester, 303 3rd Ave., Iowa City, Iowa 52240

Filed May 9, 1974, Ser. No. 468,229
Int. Cl.² B65D *5/54*
U.S. Cl. 206—531 **6 Claims**



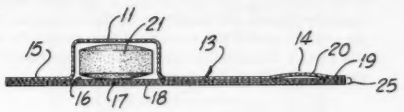
1. A re-usable dispensing package for medication in the form of tablets, capsules, or the like, said package comprising a re-usable outer shell having spaced-apart top and bottom portions each containing a plurality of openings, side portions of said shell joining said top and bottom portions to form a hollow shell open at one end, the said openings in the top portion of said shell being in substantial alignment with the openings in the bottom portion, a re-usable insert having a plurality of openings corresponding in size and relative location to the openings in the top and bottom portions of said shell, said insert being of a size so as to be slidably insertable in the open end of said shell with the openings in said insert in alignment with the openings in the top and bottom portions of said shell, a disposable packaging component having a plurality of pockets of a size and relative location corresponding to the openings in said insert, thereby providing for nesting of said packaging components in said insert when said package is assembled, each of said pockets being of a size sufficient to hold a single dose of said medication, and a thin flat cover overlying said packaging component when said package is assembled thereby to enclose said pockets, the portion of said cover overlying said pockets being breakable to provide for removal of the medication from the pockets, said packaging component and cover being easily separable from said insert to facilitate disposal of said component and cover.

3,921,805

RUPTURABLE BLISTER PILL PACKAGE WITH SAFETY BACKING

Newton L. Compere, 905 Sherwood Drive, Lake Bluff, Ill. 60044

Continuation-in-part of Ser. No. 296,192, Oct. 10, 1972, Pat. No. 3,809,221. This application July 9, 1973, Ser. No. 377,326
Int. Cl.² B65D *73/00, 83/04*
U.S. Cl. 206—532 **3 Claims**



3. A protective childproof package comprising:

a first sheet having one or more flexible blisters which form compartments, each blister being adapted to receive medicament; and having a line of weakening along one edge; and

a backing sheet closing and sealing the compartments formed by the blisters in the first sheet and being secured to the first sheet along each edge of said first sheet and over substantially the entire backing sheet surface area except at each blister and at an unsecured area directly under the line of weakening;

said backing sheet comprising a foil sheet, a sheet of polyethylene terephthalate, and a sheet of paper wherein the backing sheet is secured together with intermediate layers of an adhesive;

said backing sheet secured to said first sheet such that said backing sheet cannot be forced out of engagement with said first sheet when force is applied to said flexible blisters;

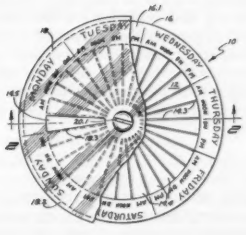
said backing sheet having at least one sheet of material therein which has sufficient strength so that the backing sheet can neither be ruptured nor forced out of engagement with the first sheet when force is applied to the medicament from the blister side of the package.

3,921,806

PILL DISPENSER

Joyce L. Wawracz, 9108 Upton Ave. South, Bloomington, Minn. 55431

Filed June 10, 1974, Ser. No. 477,674
Int. Cl.² B65D *85/56*
U.S. Cl. 206—534 **13 Claims**



1. A pill dispenser for carrying a week's supply of pills to be dispensed at the rate of one or more pills several times a day, the dispenser comprising:

a cylindrical container including a circular bottom plate with a central upright mounting post and a circumferential wall rising from the periphery of the base plate and having an upper, horizontally extending flange, 29 spaced, stationary, upright divider walls disposed radially between the mounting post and circumferential wall and

dividing the container into 28 pill-receiving compartments and a compartment-size blank segment, the compartments having internal volumes of at least 0.15 cubic inches, the horizontal flange bearing the names of sequential days of the week opposite each sequential group of four compartments and viewable from above, the dispenser having a circular cover including means permitting the names of the sequential days to be viewed from above, the cover being rotatably connected at its center to the mounting post and having a periphery extending readially beyond the periphery of the horizontal flange, the cover having a slot positioned to sequentially overlie and permit sequential access to the compartments from above as the cover is rotated.

3,921,807

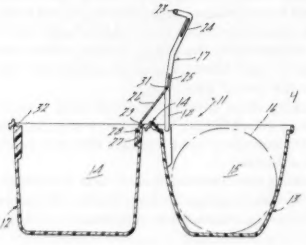
BOTTLE HOLDER FOR LUNCH KIT

Paul R. Duevel, Norwich, Conn., assignor to King-Seeley Thermos Company, Ann Arbor, Mich.

Filed May 13, 1974, Ser. No. 469,348

Int. Cl.² B65D *43/16*; A45C *11/20*

U.S. Cl. 206—544 **8 Claims**



1. A lunch kit or the like comprising a container comprised of first and second container members movable relative to each other between a closed position and an opened position, said container members defining a cavity when in their closed position and providing access to said cavity when in their opened position, a retaining member supported by one of said container members for movement between a retaining position and a released position, said retaining member being adapted to coact with one of said container members when in its retaining position to restrain a vacuum bottle or the like within at least a portion of said cavity and being positioned free of contact with the vacuum bottle to permit removal of the vacuum bottle when in its released position, and means for positively moving said retaining member from its retaining position to its released position when said container members are moved from their closed position to their opened position and for positively moving said retaining member from its released position to its retaining position when said container members are moved from their opened position to their closed position.

3,921,808

APPARATUS FOR SORTING OUT DEFECTIVE ONES FROM A CONTINUOUS SUPPLY OF MOLDINGS OF BOTTOMED CYLINDRICAL SHAPE SUCH AS CUPS

Yasuo Sakai, c/o Aiden Kabushiki Kaisha, 25-6, 2-chome, Hongo Bunkyo-ku, Tokyo, Japan

Filed Nov. 14, 1973, Ser. No. 415,554

Claims priority, application Japan, Nov. 17, 1972, 47-115445

Int. Cl.² B07B *1/15*

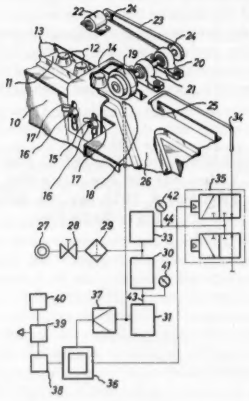
U.S. Cl. 209—74 R **4 Claims**

1. An apparatus for sorting out defective ones from a continuous supply of bottomed cylindrical objects, comprising in combination:

a first passageway for the bottomed cylindrical objects having a receiving end and an exit end, said bottomed cylindrical objects being successively loaded on said first passageway at said receiving end thereof in such a manner that each of said bottomed cylindrical objects is placed with its bottomed end directed upward;

means for successively feeding said bottomed cylindrical objects along said first passageway from said receiving to said exit end thereof;

a first air outlet formed in the bottom surface of said first passageway at a point intermediate between said receiving and said exit end thereof, said first air outlet being adapted to ascertain the presence of any defect in each of said bottomed cylindrical objects traveling thereover by delivering air therein at a prescribed pressure;



a second passageway branching off from said first passageway at a point on the downstream side of said first air outlet;

a second air outlet for delivering a forced current of air across said first passageway whereby said bottomed cylindrical objects can be directed into said second passageway; and

a pneumatic circuit associated with said first and second air outlets, said pneumatic circuit being effective to cause said second air outlet to direct only a predetermined one of defective and non-defective classes of said bottomed cylindrical objects into said second passageway while the other class of said bottomed cylindrical objects are allowed to travel to said exit end of said first passageway.

3,921,809

FRUIT CLEANER

George L. Smith, New York St., Sanford, Fla. 32771

Filed July 17, 1974, Ser. No. 489,189

Int. Cl.² B07B *1/15*

U.S. Cl. 209—98 **8 Claims**

1. Fruit cleaning apparatus comprising:

a frame member having opposing sides and defining an input end and an output end;

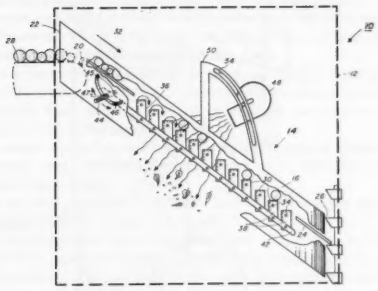
a plurality of plates fixed between said sides of said frame member, said plates stepped downward in a direction of fruit feed from said input end towards said output end with spaces defined between adjacent plates;

means for directing a fluid flow through said spaces;

two blower holding members, each supported by one of said sides and each including a curved slot therein;

a shaft supporting said blower and extending through each said slot;

movement of said shaft along said slots changes the fluid flow direction through said spaces, said plates and said



fluid flow means cooperating to separate unwanted materials from fruit passing in said direction of feed.

3,921,810

TALC-MOLYBDENITE SEPARATION

Richard O. Huch, and Pedro Valles, both of Tucson, Ariz., assignors to Pima Mining Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 216,723, Jan. 10, 1972, abandoned. This application Sept. 27, 1973, Ser. No. 401,151

Int. Cl.² B03D *1/06*

U.S. Cl. 209—167 **22 Claims**

1. A method of separating ore or concentrate having molybdenite and a substantial amount of hydrophobic silicate containing magnesium by froth flotation to obtain a molybdenite enriched concentrate and hydrophobic silicate enriched tailings, which method consists essentially of:

1. forming a dual agent treated aqueous pulp of said ore or concentrate, said dual agent consisting essentially of

I. (a) water soluble metallic salt of a weak base and a strong acid, and

(b) water soluble alkali metal, water soluble alkaline earth metal or water soluble ammonium salt of a weak acid selected from the group consisting of boron acids, carbonic acids, acids of phosphorous and silicic acids; or

II. (a) water soluble zinc salt of a strong acid, and

(b) water soluble salt of hydroferrocyanic acid, and

2. subjecting said dual agent treated aqueous pulp to froth flotation separation whereby a molybdenite enriched concentrate is floated and hydrophobic silicate is selectively depressed into the tailings from said froth flotation separation.

3,921,811

MEDIA HOLDERS FOR BOOKSHELVES

Jennie Rose Dameron, 175 Stonewall Heights, Abingdon, Va. 24210

Filed June 13, 1974, Ser. No. 479,185

Int. Cl.² A47B *65/00;* **A47F** *5/10*

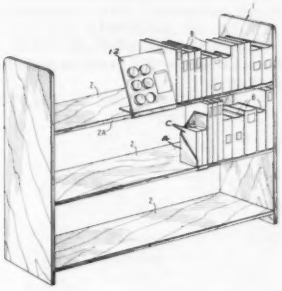
U.S. Cl. 211—43 **10 Claims**

1. A media support rack in combination with a bookshelf having top and bottom surfaces and a forward edge, said top surface of said bookshelf supporting books uprightly in a row so that bound edges of the books face forwardly, said rack comprising:

a holder plate having a lower edge portion extending parallel to said forward edge of said bookshelf;

said plate extending in an oblique direction upwardly and rearwardly from said lower edge portion so as to be oriented for abutting a side of a book to support the book uprightly;

said plate presenting a generally forwardly facing face having means which removably supports a media-carrying container; and



a clamping section rigidly attached relative to said plate adjacent said lower edge portion and including a pair of vertically spaced bookshelf engaging means engaging said top and bottom surfaces of said bookshelf to maintain said plate in its oblique position.

3,921,812

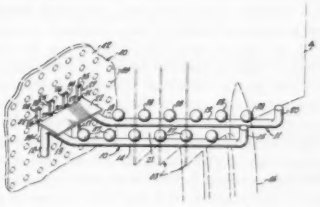
SUPPORTING DEVICE

Edward M. Hamrock, Whittier, and Earl David Pressler, Downey, both of Calif., assignors to Enterprise Products, Inc., Downey, Calif.

Filed Dec. 22, 1972, Ser. No. 317,520

Int. Cl.² A47F *5/00*

U.S. Cl. 211—60 T **9 Claims**



1. A supporting device for tools or the like comprising

a duality of elongated spaced elements for engagement by a tool or the like, said elements defining an elongated opening therebetween adapted to receive the handle of such a tool, a plurality of spaced abutments on the upper surfaces of said elements for retaining such tools on said elements, a first means for support projecting downwardly at one end of said elements,

said first means for support including a plurality of individual spaced prongs for alternatively engaging the forward side of a vertical structure and extending through openings in a horizontal structure,

a second means for support projecting upwardly at said end of said elements,

said second means for support being substantially parallel to said first means and spaced outwardly therefrom, said second means for support including a plurality of individual spaced prongs for engaging the rearward side of a vertical structure and cooperating with said first means for support in holding said device to such a vertical structure, and

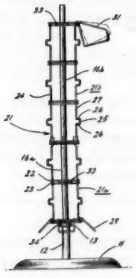
a third means for support inwardly of said first and second means for support, and substantially perpendicular

thereto for resting on a horizontal structure and cooperating with said first means for support in holding said device to such a horizontal structure.

3,921,813
KNOCKDOWN DISPLAY RACK

Alfonse Cimino, Livingston, N.J., assignor to Butler Industries, Inc., Newark, N.J.

Filed Nov. 8, 1974, Ser. No. 521,973
Int. Cl.² A47F 5/14
U.S. Cl. 211—131 **6 Claims**



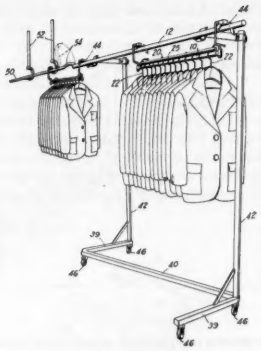
1. A display rack for merchandise comprising a base having an upstanding support post, a framework mounted on said post for rotation relative to said base, said framework comprising a series of support bars disposed horizontally at a plurality of levels, each level including an interlock bar mounted in spaced parallel relation closely adjacent to said support bar, and at least one merchandise-receiving receptacle mounted on said support bar at each level, said merchandise-receiving receptacle comprising a hanger with upright legs each leg having a bight portion and free end portion extending from said bight portion to form a hook said hooks engaging with the support bar at that level, said legs and hooks being formed of wire capable of being bent by manual pressure and of a diameter less than the spacing between said support bar and said interlock bar said spacing between each said support bar and said interlock bar being less than the length of said free end portion so that the free end portion of said hook may be engaged therebetween and bent into closed or clinched position by pivotal displacement of said receptacle on said support bar.

3,921,814
GARMENT RACK

Archie Solomon, 950 Sun Valley Drive, P.O. Box 395, Roswell, Ga. 30075

Filed Mar. 26, 1974, Ser. No. 454,806
Int. Cl.² A47F 5/00
U.S. Cl. 211—162 **6 Claims**

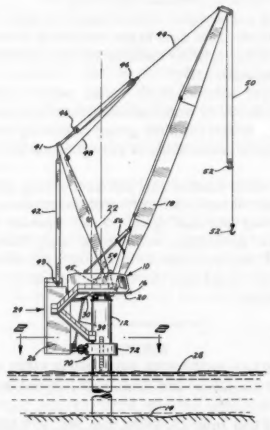
1. A portable garment rack for movably supporting a set of hangers and articles hung thereon and comprising a hanger rod upon which a set of hangers may be hung; a pair of spaced arcuate rods extending upwardly from and then arcing over to one side of said hanger rod; an elongated bar slidably mounted on said pair of arcuate rods for movement onto and off of an upper surface of the hanger rod; said elongated bar being retained out of contact with the hanger rod when moved to the ends of the arcuate rods remote from said hanger rod; said elongated bar being parallel to and of substantially the same linear extent as said hanger rod: and a pair of hooks extending upwardly from said hanger rod with each hook member carrying at least one roller for rotation upon a rail supported above the hanger rod.



3,921,815
CRANE WITH A SUSPENDED ROTATABLE COUNTERBALANCE

Archer W. Brown, deceased, late of Mendota Heights, Minn. (by Inell B. Brown, administratrix), and Talford S. DeCuir, Houston, Tex., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Filed May 3, 1974, Ser. No. 466,628
Int. Cl.² B66C 13/16, 23/72
U.S. Cl. 212—3 **16 Claims**



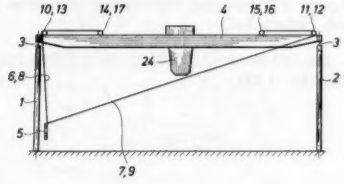
1. In a crane having a first support, a machinery deck rotatably mounted on a generally vertical axis with respect to said first support, an upstanding mast and an upstanding boom both pivotally mounted on a forward portion of the machinery deck for movement in a vertical plane passing through the axis of rotation of the machinery deck with respect to the support, a first suspension, means mounting said first suspension between an upper portion of said mast and an upper portion of said boom, a load line extending over the point of said boom, means for rotating said deck, means for powering the load line, and a load handling device supported by the load line hanging from the point of the boom; the improvement including:

A. a counterweight;
B. means for pivotally supporting said counterweight at a rearward portion of the machinery deck for free swinging movement downwardly with respect to that deck;
C. counterweight support wheels mounted with respect to the counterweight to rotate on axes lying in planes containing the axis of rotation of the deck;
D. a counterweight load bearing entity fixedly positioned with respect to said first support and providing a counterweight load bearing surface in position to receive said counterweight support wheels;
E. means including said counterweight support means to cause said counterweight to rotate with said deck in a horizontal plane;
F. a second suspension between said counterweight and an upper portion of said mast; and
G. said counterweight being provided with a bearing platform in position to come into bearing relationship to said rearward portion of said deck when said counterweight is lifted by said second suspension means from load transmitting relationship with said counterweight load bearing entity.

3,921,816
OVERHEAD OR GANTRY CRANE WITH A YOKE

Eigil Madsen, Tangbjergvej 43, Svestrup pr. Olstykke, Denmark

Continuation of Ser. No. 138,706, April 29, 1971, abandoned. This application June 11, 1974, Ser. No. 478,426
Int. Cl.² B66C 17/00
U.S. Cl. 212—27 **3 Claims**

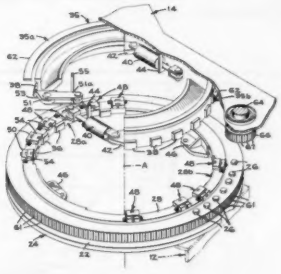


1. An overhead crane including a girder positioned for movement thereunder of a load, comprising;
travelling girder means bearing four pulleys, one on each side of said travelling girder means;
four suspending means, each of said four suspending means including a rope part extending from a rope drum mounted in fixed relation to said girder through a corresponding one of said pulleys;
an elongated load carrying yoke means, first and second support points attached to said yoke means in the region of the respective ends of said yoke means;
means fixing one pair of said rope parts to each said support points, the two rope parts of each pair extending from said points upwardly to drums on opposite ends of the girder means and comprising an operating means for elevating the load and transporting the load for placement at any desired elevation throughout the region beneath the girder, including positions vertically beneath the respective ends thereof;
and means causing said drums to operate in control of said rope parts by pairs for raising and lowering said yoke selectively with or without displacing the yoke in a longitudinal and/or lateral direction.

3,921,817
DISCONNECT MECHANISM FOR UPPER SECTION OF CRANE

George L. Petrik, and James R. Dvorsky, both of Cedar Rapids, Iowa, assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 6, 1974, Ser. No. 440,233
Int. Cl.² B66C 23/84
U.S. Cl. 212—66 **14 Claims**

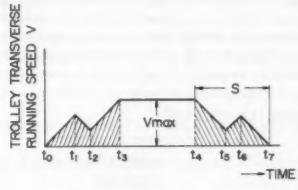


1. In a crane having a base section and having an upper section, the combination comprising means defining a socket member in one of said sections, means defining a fitting member in the other of said sections, one of said members being rotatable about an axis therethrough, said fitting member receivable into said socket member when the upper section is lowered onto the base section, and means including a power operated actuator to effect a clamping between said members after the upper section is lowered onto the base section to hold the upper section firmly and rotatably on the base section.

3,921,818
CRANE SUSPENSION CONTROL APPARATUS

Toshio Yamagishi, Chofu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

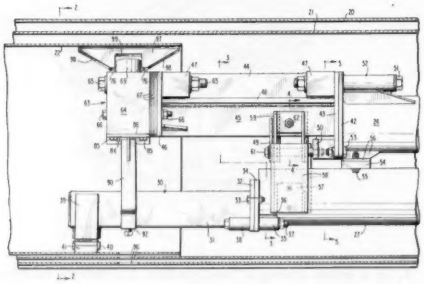
Filed Mar. 28, 1974, Ser. No. 455,906
Claims priority, application Japan, Apr. 2, 1973, 48-37665
Int. Cl.² B66C 19/00
U.S. Cl. 212—132 **10 Claims**



1. A control system for a suspension type crane running in the transverse direction, the improvement comprising means for providing a start command signal, means responsive to said start command signal for determining a maximum transverse running speed of said crane corresponding to the distance between the starting position and a predetermined target position of said crane, means for generating a deceleration command signal when said crane reaches a point a predetermined distance before said target position, which is determined by said maximum transverse running speed, and means responsive to said start command signal or said deceleration command signal for providing a predetermined acceleration-deceleration pattern signal corresponding to said maximum transverse running speed, whereby the transverse running

speed of said crane is controlled so as to stop said crane at said target position.

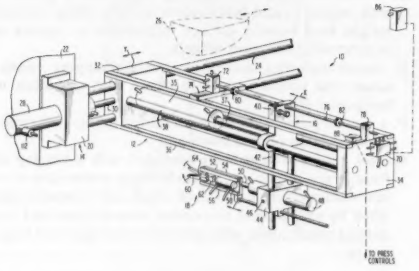
3,921,819
BOOM LATCH MECHANISM
Stanley R. Spain, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Filed July 26, 1974, Ser. No. 492,265
Int. Cl.² B66C *23/62*
U.S. Cl. 212—144 **21 Claims**



14. A latch mechanism for a telescopic boom having at least three boom sections having an interior space including a manual fly section, a midsection and an innermost section, and power means for extending and retracting said mid-section, comprising a support member mounted on the boom innermost section projecting forwardly into the interior space of said midsection and into the interior space of said manual fly section telescoped in the midsection, a pair of cooperating latch components mounted one each on the support member and on the manual fly section for relative movement, said cooperating latch components adapted to engage and interlock in one relative position of the manual fly section to the innermost section when moved together in response to operation of said power means, and manual means for positively coupling said manual fly section and the mid-section together for movement as a unit by said power means and for allowing the power means to move the mid-section relative to the manual fly section when the latter is latched and said manual means is removed, and one of said cooperation manual latch components being manually and mechanically adjustable by a mechanical implement directly hand operable from the boom exterior between an operative or a non-operative position with respect to the other of said cooperating manual latch components thereby respectively allowing or preventing the engagement and interlocking of said cooperating latch components in said one relative position.

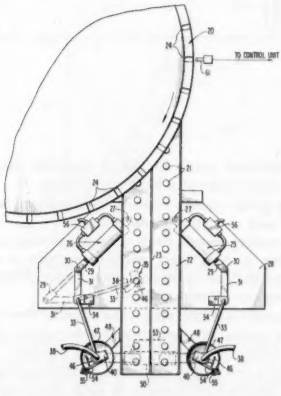
3,921,820
PICKER
Robert Raymond Crockett, Westfield, Mass., assignor to Alpha Machine & Tool Corporation, Chicopee, Mass.
Filed Mar. 4, 1974, Ser. No. 447,667
Int. Cl.² B25J *9/00*
U.S. Cl. 214—1 BB **13 Claims**

1. A picker comprising a mounting unit, a carrier carried by said mounting unit for linear movement along a first predetermined linearly extending path, a first fluid actuated cylinder for moving said carrier in opposite directions along said predetermined path, a gripping unit carried by said carrier for movement with said carrier along said first predetermined path and for linear movement along a second predetermined linearly extending path substantially normal to said first predetermined path, a second fluid actuated cylinder for moving said gripping unit in opposite directions along said second predetermined path, said gripping unit including a pair of gripping elements movable between open and closed positions, means carried by said gripping unit for moving said elements between said open and closed positions, a carriage slidably carried by said carrier for linear movement along a path parallel to said second predetermined path, means coupling said gripping unit to said carriage for movement there-



with, said second fluid actuated cylinder being carried by said carrier for moving said carriage and the gripping unit carried thereby in opposite directions along said parallel path, a third fluid actuated cylinder carried by said carriage for movement therewith and coupled between said gripping unit and said carriage to provide for movement of said gripping unit relative to said carriage.

3,921,821
COUNT INTERVAL SAMPLING MECHANISM
Robert J. Champion; Ronald K. Palm; Jesse P. T. Harris, Jr., all of Greenville, and William D. Kivett, Taylors, all of S.C., assignors to Engineering Development Associates Incorporated, Taylors, S.C.
Filed Mar. 27, 1974, Ser. No. 455,140
Int. Cl.² B65G *47/57;* B25J *15/06;* G01N *1/04*
U.S. Cl. 214—1 BH **8 Claims**



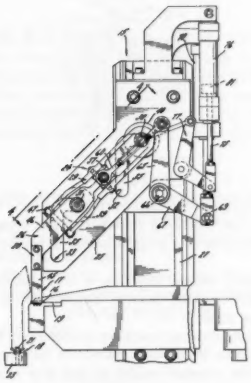
1. Apparatus for sampling small objects in dual product streams comprising a pair of product receivers fixedly mounted in relation to the dual product streams with one receiver near one side of each product stream, a pair of pivoted sample transport arms mounted near said product streams and adapted to swing between positions directly over said streams and directly over said receivers, a power means connected with each pivoted transport arm to move the arm cyclically between said positions, a suction nozzle object

pick-up device carried by each transport arm and having a suction port operable to capture a single sample object from one product stream for delivery by the arm to one sample receiver, a resilient suction cut-off element carried by each suction nozzle and having a port normally in registration with the nozzle suction port, and a fixed substantially rigid contact element on each receiver in the path of movement of said resilient suction cut-off element to shift the latter to a sample release position above the receiver in which the port of the suction cut-off element is separated from the port of said nozzle.

3,921,822
MACHINE FOR PICKING UP, TRANSFERRING AND PLACING PARTS

Paul H. Dixon, Belvidere, Ill., assignor to Babette Dixon as Trustee of a trust identified as Paul H. Dixon Trust dated Jan. 28, 1975, Rockford, Ill.

Filed Apr. 26, 1974, Ser. No. 464,627
Int. Cl.² B65G 47/52
U.S. Cl. 214—1 BB **15 Claims**

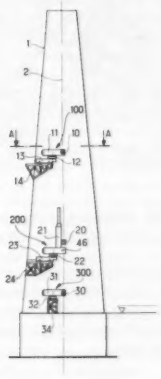


1. A parts handling machine comprising a support, transfer mechanism movable back and forth on said support and operable first to pick up a part at a loading station and then to move the part to and release the part at a delivery station spaced from said loading station, a pair of slots formed in said support and spaced from one another along the direction of movement of said transfer mechanism, said slots being similar in shape and defining the path of movement of said transfer mechanism, said transfer mechanism comprising a carriage having a pair of transversely extending guides spaced from one another along the direction of movement of said transfer mechanism and received within said slots to confine movement of said carriage to the path defined by said slots, a pair of opposed part holding jaws mounted on said carriage to move back and forth with the carriage between said loading and delivery stations and to move relative to the carriage between open and closed positions, and actuator means connected to said jaws and operable when the jaws are in each station to move the jaws relative to said carriage until the jaws stop upon reaching one of said positions and thereafter being operable to move said carriage on said support so as to move the jaws from one station to the other.

3,921,823
MOVEMENT COMPENSATING APPARATUS FOR FLOATING DRILLING

Rene Bourree, and Michel Brin, both of Le Plessisi Robinson, France, assignors to Groupment pour les Activities Atomiques et Avancees "GAAA", Le Plessis-Robinson, France

Continuation-in-part of Ser. No. 208,106, Dec. 15, 1971, abandoned. This application Jan. 30, 1974, Ser. No. 438,045
Claims priority, application France, Dec. 15, 1970, 70.45175
Int. Cl.² E21B 19/00
U.S. Cl. 214—2.5 **2 Claims**



1. Apparatus for automatically shifting sections of pipe back and forth between operational and storage positions in a derrick which is part of a floating drilling rig, said apparatus comprising at least two shifting units arranged vertically in the derrick, each of said shifting units comprising:

a. a carriage movably mounted for horizontal movement on a frame fixedly connected to the derrick;
b. means for radially moving said carriage;
c. a turret rotatably mounted on said carriage;
d. means comprising at least one rotation jack for rotating said turret on said carriage;
e. an arm movably mounted on said turret, said arm comprising a horizontal part and a vertical part;
f. means comprising a jack for effecting horizontal movement of said arm on said turret;
g. gripping means mounted on the vertical part of said arm; and
h. means comprising a jack mounted on said arm for controlling the opening and closing of said gripping means.

3,921,824
STORING MECHANISM FOR TOBACCO-GATHERING MACHINE

Jean-Baptiste Larroche, GL800 Nay, 11 Cours Pasteur, France

Filed July 13, 1973, Ser. No. 378,900
Claims priority, application France, July 19, 1972, 72.25959
Int. Cl.² A21B 1/06
U.S. Cl. 214—5.5 **6 Claims**

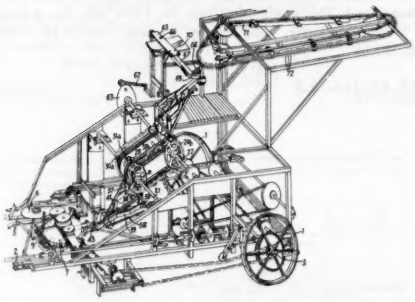
2. A mechanism for storing tobacco stalks gathered by an automatic machine of the type having means for individually catching successive tobacco stalks, cutting said stalks, turning them upside down and presenting them to the rear of the gathering machine, said storing mechanism comprising

a sloping surface adapted to carry a plurality of horizontal tubes in parallelism;

two movable collapsible sloping supports situated at the lower extremity of said sloping surface, the ends of said

supports being adapted to hold one tube in an operative position;

means controlling the shifting of the tubes in succession over said surface into said position upon collapsing of the supports and release of the foremost tube;



horizontal storing slideways and means for urging each successive foremost tube when released onto said storing slideways,

the feeding means being adapted to make the successive cut tobacco stalks slide along the foremost tube;

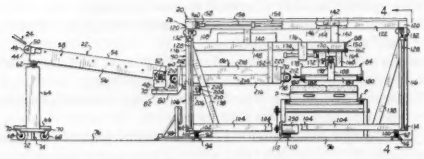
the mechanism further including means collapsing the supports when a predetermined number of stalks has entered said lowermost tube.

3,921,825

BAG-TURNING STACKING PALLETIZER

Robert T. Sheehan, 14180 Shadywood, Plymouth, Mich. 48170

Filed Nov. 12, 1970, Ser. No. 88,569
Int. Cl.[2] B65G *57/24*
U.S. Cl. 214—6 P **15 Claims**



1. A bag-turning palletizer, comprising

a pallet-supporting structure disposed at a bag-stacking station,

and a bag stacker disposed adjacent said pallet-supporting structure at said bag-stacking station and including

a base structure mounted for movement laterally of said pallet support structure,

an elevator mounted on said base structure for upward and downward movement relatively to said base structure,

a stacker carriage mounted on said elevator for longitudinal movement thereon toward and away from said pallet-supporting structure,

a bag-transfer conveyor mounted on said carriage for longitudinal movement therewith,

a bag turner rotatably mounted on said carriage adjacent said transfer conveyor for longitudinal movement with said carriage and rotatable between a longitudinal position aligned with said transfer conveyor and a lateral position transverse to said transfer conveyor,

said bag turner having a bag discharge outlet and a closure movably mounted thereon for travel into the out of closing relationship with said bag outlet,

power-operated means for moving said base structure laterally of said pallet-supporting structure,

power-operated means for moving said elevator upward and downward relatively to said base structure,

power-operated means for moving said carriage longitudinally of said elevator,

power-operated means for actuating said transfer conveyor,

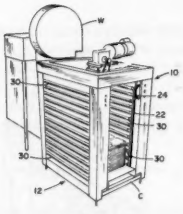
and power-operated means for rotating said bag turner between said longitudinal and transverse positions thereof.

3,921,826

TRAY STACKING SYSTEM

Howard Gene Rice, 1109 Hadrian Court, Irving, Tex. 75060, and Lawrence Peter Kitterman, 11426 Willow Lane, Cypress, Tex. 77429

Filed May 25, 1973, Ser. No. 363,962
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B65G *57/14*
U.S. Cl. 214—6 FA **10 Claims**



1. A tray stacking system comprising:

a plurality of tray stacking members each comprising an elongate tray receiving ledge adapted to receive one edge of a tray;

endless conveyor means defining a tray stacking course extending downwardly from a tray receiving zone to a tray stacking zone;

means supporting the tray stacking members on the endless conveyor means in opposed pairs and for pivotal movement between dormant positions and tray receiving and supporting positions wherein the tray receiving ledges of the tray stacking members face one another;

said means for supporting the stacking members on the endless conveyor means comprising a plurality of pairs of pins each including a first pin for pivotally supporting one end of one of the stacking members and a second pin for controlling the pivotal positioning of the tray stacking member when the tray stacking member is in the tray receiving and supporting position;

means for pivoting each tray stacking member to the tray receiving and supporting position prior to the movement of the tray stacking member into the tray receiving zone under the action of the endless conveyor means; and

means responsive to engagement of each tray stacking member with a tray in the tray stacking zone for pivoting the stacking member to the dormant position.

3,921,827

ARMS FOR STACKING MACHINE

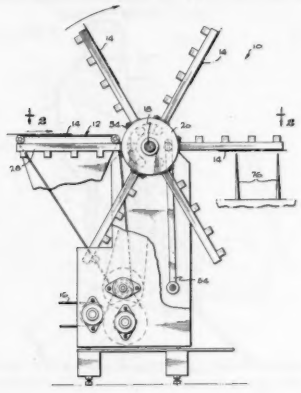
Richard L. Joice, 19812 Lassen St., Chatsworth, Calif. 91311

Continuation of Ser. No. 268,494, July 3, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 460,023
Int. Cl.[2] B65G *57/08*
U.S. Cl. 214—6 FS **6 Claims**

1. In a stacking machine for picking up bags and moving them to the delivery position, the stacking machine having a

central shaft upon which are mounted hub means for rotation about the axis of said shaft, first and second arms being mounted in said hub means, the improvement comprising:

said first and second arms having a first working face with first vacuum holes therein, and said arms having a second



working face with second vacuum holes therein, said second working face being angularly disposed with respect to said first working face, each of said arms being selectively positionable within its hub means so that said arms can carry either said first working face or said second working face in bag-engaging position.

3,921,828

APPARATUS FOR TRANSFERRING GOODS WITHIN A STORAGE SYSTEM

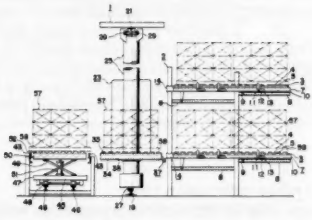
Dairi Suizu, Sowa, Japan, assignor to Okura Yusoki Kabushiki Kaisha, Kakogawa, Japan

Filed Apr. 20, 1972, Ser. No. 245,875

Claims priority, application Japan, June 29, 1971, 46-47431

Int. Cl.² B65G *1/06*

U.S. Cl. 214—16.4 C **1 Claim**



1. An apparatus for carrying in and carrying out stored goods and storing the same comprising

a goods supporting shelf assembly (2) comprising a plurality of goods supporting shelves (3) arranged in multiple layers and multiple rows;

pull-out means (10) mounted in each of said shelves (3) of the goods supporting shelf assembly (2) for pulling out toward the goods carry-out side the goods supported on the goods supporting shelves (3), said pull-out means (10) having a plurality of locking members (12) provided on said pull-out means (10) in positions suitably spaced apart from each other, said locking members (12) being maintained in an inoperative position when a force in the forward direction is applied thereto and in an operative position when a force in the backward direction is applied thereto, and an engaging member (14) mounted on the goods carry-out side of the pull-out means (10) having an engaging frame (15) formed with an opening (16) and pressing plates (17) disposed to face an inner side of the engaging opening (16), guide means for said pull-out means (10) located below the surface of said locking members (12); and

stacker cranes (22, 23) disposed on both the goods carry-in side and goods carry-out side of said goods supporting shelf assembly (2) for movement along a path substantially at right angles to the longitudinal axis of the goods supporting shelf assembly (2), said stacker crane (22) disposed on the goods carry-in side having an elevator (30) for carrying goods in the shelves of the goods supporting shelf assembly (2), and a push-in member (32) adapted to move toward and away from the goods supporting shelf assembly (2), and said stacker crane (23) disposed on the goods carry-out side having an elevator (34) for carrying goods out of the shelves of the goods supporting shelf assembly (2), a receiver (36) provided on said elevator (34) for receiving goods thereon, and a pull-out engaging member (37) provided on an end of said receiver (36) at the goods carry-out side of the goods supporting shelf assembly (2) and having a hook (39) adapted to be brought into and out of engagement with said opening (16) of the engaging frame (15) and to be contacted with said pressing plates (17) so as to push it, whereby the goods on one of the shelves of the goods supporting shelf assembly (2) can be moved from the goods carry-in side to the goods carry-out side by the reciprocating motion of the pull-out engaging member (37) engaged with the engaging member (14) of said pull-out means (10).

3,921,829

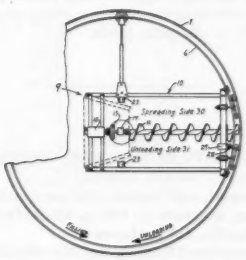
HORIZONTAL ROTARY SWEEPS FOR FEED STORAGE TANKS

Charles F. Lambert, Jr., Louisville, Ky., assignor to Clayton & Lambert Manufacturing Co., Buckner, Ky.

Filed July 24, 1974, Ser. No. 491,364

Int. Cl.² B65G *65/32, 65/38*

U.S. Cl. 214—17 CB **1 Claim**



1. A spreading/unloading apparatus for use in filling a material, such as silage, into and unloading it from a given cylindrical feed storage tank or silo containing a vertically movable nonrotatable supporting assembly, which has a vertical center axis, comprising:

A. a rotary sweep mounted on said assembly for vertical raising and lowering movement therewith during respective silo filling and unloading operations,

1. said sweep having opposite outer spreading and unloading sides;

B. a single sweep auger mounted on said sweep to extend from the vicinity of said center axis to the vicinity of a vertical cylindrical wall of said silo,

1. said auger having corresponding outer spreading and unloading sides, and
2. said auger being operative to engage the top face of a column of silage during both spreading and unloading;

C. reversibly motorized sweep drive means
1. for positively rotating said rotary sweep slowly about said vertical center axis
   a. in one direction during filling with its outer spreading side foremost, and
   b. in the opposite direction during unloading with its opposite outer unloading side foremost; and

D. reversibly motorized auger drive means
1. for positively rotating said sweep auger rapidly about its long axis with its lower half
   a. moving forwardly in one direction toward its foremost spreading side during filling and
   b. moving forwardly in the opposite direction toward its foremost unloading side during unloading.

3,921,830

QUENCHER CAR SPOTTING INTERLOCK

Robert H. Bright, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 11, 1974, Ser. No. 450,144
Int. Cl.² C10B *33/10*
U.S. Cl. 214—23 **4 Claims**

1. A system whereby a coke oven quencher car is spotted relative to a coke guide and indicates to a pusher machine when said quencher car and a coke guide are properly spotted, wherein the improvement comprises:
   a. a target on said quencher car;
   b. a probe mounted to said coke guide;
   c. means for extending and retracting said probe with respect to said target;
   d. an electrical control circuit including a switch in said probe that closes when said probe contacts said target;
   e. a relay in said circuit that is energized when said switch closes;
   f. means in said circuit acting in response to said relay that completes said circuit; and
   g. means for sending a signal by said circuit to said pusher machine indicating the proper spotting of said quencher car relative to said coke guide.

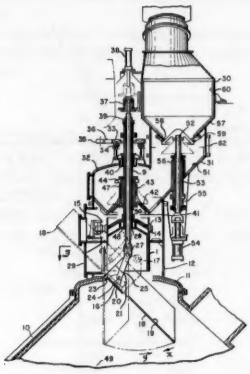
3,921,831

DEVICE FOR DISTRIBUTING RAW MATERIALS INTO BLAST FURNACE

Masaoki Takahashi, and Makoto Nishinomiya, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1974, Ser. No. 451,672
Claims priority, application Japan, Oct. 12, 1973, 48-114575
Int. Cl.² B66C *17/08*
U.S. Cl. 214—35 R **3 Claims**

1. A spreader assembly for distributing raw material into the top of a blast furnace having a fixed distribution chute, comprising a rotary, cylindrical chute into which the raw material is introduced from said fixed chute, a pair of vertical partition walls disposed within the rotary chute, the side edges of the walls being fixed to the inner wall of said chute, a cover fixed to the upper edges of the pair of partition walls, said partition walls and cover defining a chamber, raw material passages defined between the pair of partition walls and the inner surface of the cylindrical chute, a distribution chute positioned below said passages, a control rod extending into said chamber and supporting said distribution chute, means in said chamber connected to said rod to control tilting and rotary movement of the distribution chute, and means to cause said



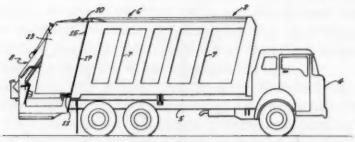
control rod, distribution chute and cylindrical chute to rotate as a unit.

3,921,832

REFUSE COLLECTION APPARATUS

Fred T. Smith, Dearborn Heights, Mich., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 264,021, June 19, 1972. This application Feb. 8, 1974, Ser. No. 440,789
Int. Cl.² B65F *3/02*
U.S. Cl. 214—82 **28 Claims**



1. In a refuse collector,

a storage body having a pair of spaced side walls defining the width of the storage body and having front and rear portions defining the length of the storage body,

braces disposed relative to the spaced side walls at progressive positions along the side walls between the front and rear portions to provide enhanced strength to the side walls,

ejection means disposed within the storage body and movable between the front and rear portions of the storage body for ejecting refuse from the storage means, the ejection means being provided with a curvature to resist in tension the forces imposed upon the ejection means by the refuse disposed against the ejection means,

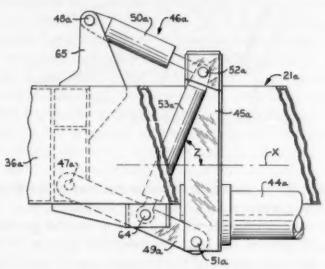
the braces having the same disposition with respect to the storage body as the ejection means, and

means operatively coupled to the ejection means for providing controlled movements of the ejection means between the front and rear portions of the storage body.

3,921,833
MATERIAL LIFTING AND TRANSPORTING VEHICLE

Frank A. Grooss, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 183,778, Sept. 27, 1971, Pat. No. 3,762,590. This application June 22, 1973, Ser. No. 372,651
Int. Cl.² B66C *23/00*
U.S. Cl. 214—130 C **4 Claims**



1. A material lifting and transporting vehicle having a front frame and normally disposed for movement along a longitudinal axis thereof,

a. a generally horizontally disposed load supporting means positioned to extend in the direction of said axis,

b. a generally vertically disposed support means having the load supporting means secured thereto, and

c. linkage means operatively connecting the support means to the front frame for permitting the load supporting means to remain substantially horizontal upon vertical upward movement thereof,

d. the linkage means including at least one first link pivotally interconnected between upper portions of the front frame and the support means and at least one second link, spaced vertically below the first link and normally disposed substantially parallel thereto, interconnected between lower portions of the front frame and the support means, and means for extending and retracting one of said links for selectively tilting the load supporting means relative to the horizontal, and

e. actuating means pivotally interconnected between the second link and the support means for selectively moving the load supporting means vertically,

f. said actuating means comprising at least one generally vertically disposed hydraulic cylinder pivotally connected at its lower end directly to said second link intermediate the ends thereof and between the pivotal connections for the second link and at its upper end to the upper portion of the support means.

3,921,834
UPPER FRAME STRUCTURE

Barry Alan Scoggin, Yorkville, and Harvey Albert Knell, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 17, 1974, Ser. No. 470,858
Int. Cl.² E02F *3/36*
U.S. Cl. 214—132 **6 Claims**

1. An excavator platform frame assembly comprising in combination:

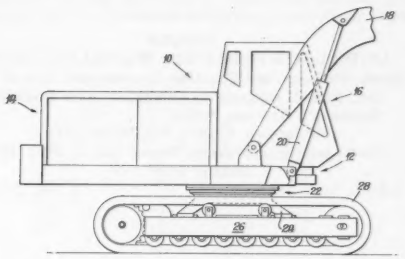
a lower frame for mounting a plurality of ground engaging wheels;

an upper platform support frame, having forward and rearward ends, for supporting a boom and an operator's station for rotation about a vertical axis on said lower frame;

forwardly extending frame means defining an operator station support means at the forward end and to one side of said upper frame;

means defining boom pivot and support means adjacent to and at one side of said operator station support frame means for supporting a boom for extension in a forward direction;

said boom pivot and support means comprising a pair of converging rails;



a cast formed cross-member welded to the forward end of said rails;

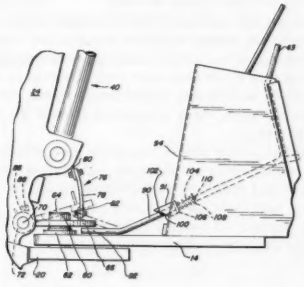
a plurality of motor brackets cast-formed integral with said cross-member, said brackets having coaxially aligned pivot pin bores; and,

a pair of boom pivot brackets secured to the upper side of said converging rails.

3,921,835
RELEASABLE LOCK MEANS FOR BOOM

Donald C. Baker, Rosedale; Lloyd A. Brewer, West Terre Haute, and Herman J. Maurer, Terre Haute, all of Ind., assignors to J. I. Case Company, Racine, Wis.

Filed May 28, 1974, Ser. No. 473,703
Int. Cl.² E02F *3/32*
U.S. Cl. 214—138 R **4 Claims**



1. In an earth-working implement having a boom pivoted about a horizontal pivot axis on a support with an earth-working unit pivoted on the free end of said boom, said support being pivoted about a vertical pivot axis on a base with said vertical pivot axis being defined by at least one pin fixed to said support and rotatable on said base, and releasable lock means between said boom and said support, said releasable lock means including a first member on one of said support and said boom, a second member on the other of said support and boom, said second member including a ring structure pivoted about a horizontal pivot axis on the other of said support and boom and including an opening within its confines for receiving said first member, said first member being an upper free end portion of said at least one pin, biasing means cooperating with said second member for normally maintaining said second member in a first position and accommodating movement from said first position, said members

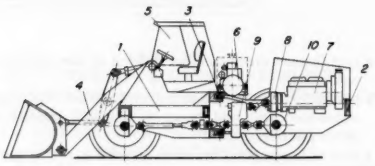
being positioned so that pivotal movement of said boom to a storage position will produce engagement between said members and cause movement of said second member from said first position, said biasing means returning said second member to said first position when said first member is aligned with said opening, and release means for moving said second member from said first position and separate said members.

3,921,836

ARTICULATED HYDRAULIC TRAVELLING LOADER

Zenon Wyslouch, and Eugeniusz Brachmanski, both of Wroclaw, Poland, assignors to Fabryka Maszyn Budowlanych "Fadroma", Wroclaw, Poland

Filed Nov. 1, 1973, Ser. No. 411,811
Claims priority, application Poland, Nov. 4, 1972, 158617
Int. Cl.² B60P *1/16*
U.S. Cl. 214—142 **3 Claims**



1. A self-propelled articulated loading machine which comprises:
   a. first and second frame sections;
   b. an articulated joint interposed between and connecting said frame sections to permit relative movement therebetween;
   c. front and rear wheel-bearing axles mounted respectively on said first and second frame sections;
   d. a hydraulically operable jib and loader mechanism carried by said first frame section;
   e. a driver's cab carried by said first frame section;
   f. a first prime mover mounted on said first frame section behind said driver's cab located a predetermined distance behind said front axle such that it serves as a counterweight for said jib and loader mechanism, said first prime mover being drivably connected to said jib and loader mechanism;
   g. a second prime mover operable independently of said first prime mover mounted on said second frame section behind said rear axle and drivably connected to at least one of said front and rear axles; and
   h. first and second control systems connected respectively to said first and second prime movers.

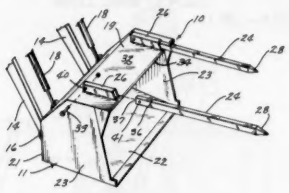
3,921,837

ROUND BALE HANDLING ATTACHMENT FOR A TRACTOR

Lloyd L. Vandewater, R.R. No. 1, Dexter, Iowa 50070

Filed Feb. 12, 1975, Ser. No. 549,311
Int. Cl.² E02F *3/81*
U.S. Cl. 214—145 **4 Claims**

1. A round bale handling attachment for a tractor with a front end loader which includes a pair of longitudinal pivoted lift arms arranged at opposite sides of the tractor with front end sections projected forwardly of the tractor and a scoop pivotally mounted between said front sections having a top wall horizontally positionable when the scoop is in a lowered position therefor, said attachment comprising:
   a. a pair of like elongated mounting members,
   b. means securing said mounting members to the upper side of said top wall extending longitudinally of and in a transversely spaced relationship to said tractor,
   c. a pair of fork members corresponding to said mounting members each of which has a rear section and a forward section projected horizontally forwardly from the front edge of said top wall when the top wall is in said horizontal position thereof, and



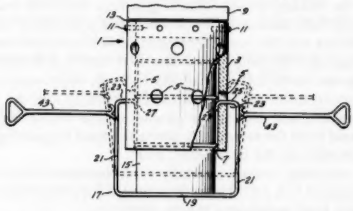
   d. means for connecting the rear section of a fork member with a corresponding mounting member,
   e. said fork members, when a bale is on the ground, being moved toward the bale for insertion therein in response to a forward travel of the tractor toward said bale.

3,921,838

METHOD FOR RETAINING MATERIAL WITHIN A PLUNGING BELL

James E. Wheeler, Baltimore, Md., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 363,710, May 24, 1973, Pat. No. 3,827,680. This application Feb. 14, 1974, Ser. No. 442,532
Int. Cl.² C21C *7/00*
U.S. Cl. 214—152 **2 Claims**



1. A method for retaining containerized reagent within a plunging bell having sidewalls forming a bottom opening and apertures through said sidewalls comprising:
   a. first positioning said containerized reagent above a support member;
   b. next, lowering said plunging bell around said containerized reagent;
   c. depending said support member from said side walls through said apertures, across said bottom opening beneath said sidewalls; and
   d. supporting said containerized reagent with said support member.

3,921,839

PACKING AND EJECTING MEANS FOR A REFUSE TRUCK

William A. Herpich, Galion, Ohio, assignor to Peabody Galion Corporation, Galion, Ohio

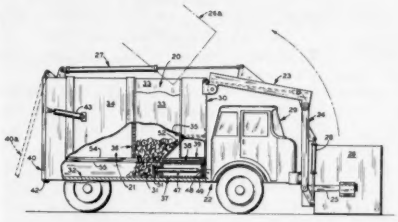
Filed Sept. 20, 1974, Ser. No. 507,817
Int. Cl.² B65F *3/02*
U.S. Cl. 214—302 **4 Claims**

1. In a refuse truck having a storage body that is defined by a top, side walls and a floor, an openable door normally closing the rear of said body and a loading compartment at the front of said body that is defined by a front wall, side walls

lying in the same vertical planes as the side walls of said body, a floor that lies in the same plane as the floor of said body and a rear wall that is common with said body and that extends downwardly to a level above the said floors for defining an opening from said compartment into said body, the improvement comprising, in combination,

a. a ram having a rear end with a face of a width extending across said compartment and said body and a heighth slightly less than the heighth of the opening between said compartment and said body, said ram having a top extending forwardly from the upper edge of said rear face,

b. hydraulic cylinder means for moving said ram from a front position forward of the floor of said loading compartment through the bottom of said loading compartment for packing refuse from said loading compartment through the opening into said body and for moving said ram along the bottom of said body for compacting refuse in said body when said door is closed and to a position adjacent the rear of said body for ejecting refuse out of the rear of said body when said door is open,



c. a plurality of superposed, planar sliding covers associated with said ram, each of said covers extending across said truck to the sidewalls thereof, the total length of the top of said ram and the said covers being at least equal to the distance from the front wall of said compartment to the rear of said body, whereby said plates prevent refuse in either said loading compartment or said body from falling down in front of said ram when said ram is extended from its front position,

d. a pair of horizontal tracks for each of said covers, said pairs of tracks extending from forward of the front wall of said compartment through said opening into and to the rear of said body and being mounted on said side walls above each other; and

e. cooperating means at the front of said ram top and at the rear and front edges of each of said covers for sequential engagement when said ram moves rearwardly beyond said loading compartment for sliding said covers along said tracks, the combined height of said ram face and thicknesses of said covers substantially equalling the height of the opening from said compartment into said body.

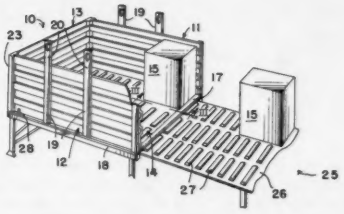
3,921,840

PORTABLE CONTAINER EMPTYING APPARATUS

Fred E. Julien, Sr., East Peoria; Elmer A. Raithel, Creve Coeur, and Carl W. Shafer, Sparland, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 4, 1974, Ser. No. 476,219
Int. Cl.[3] B65G *65/04*
U.S. Cl. 214—310 **13 Claims**

1. A container comprising a horizontally disposed bottom wall, an upstanding back wall attached on said bottom wall, a pair of upstanding and parallel sidewalls attached on said bottom wall, means defining at least two parallel rows of elongated openings through said bottom wall with the openings of each row being disposed in aligned relationship, a platform supporting said container and at least two parallel rows of roller means extending beyond the bottom wall of said container when the container is positioned on said platform, each of said roller means rotatably mounted independently on said platform and each projecting upwardly through a respective one of said elongated openings and vertically above a top surface of said bottom wall whereby articles supported on respective rows of said roller means can be moved thereon independently, alignment means cooperating between said container and said platform for locating each of said roller



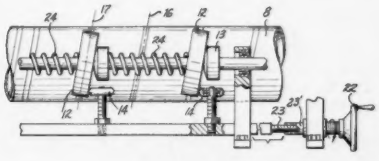
means in a respective one of said elongated openings, stop means secured on and extending above a forward end of said bottom wall, adjacent to the front open side of said container, having a vertical height less than the vertical height of the portion of each of said roller means projecting vertically above the top surface of said bottom wall and carrying means secured on said container adapted for engagement with a carrier for selectively removing said container from said platform.

3,921,841

TRANSFER DEVICE FOR HELICALLY WOUND TUBES

Tadashi Mizutani, Osaka, and Hiromichi Tachibana, Ogaki, both of Japan, assignors to Kuraray Plastics Co., Ltd., Osaka, Japan

Filed Nov. 21, 1974, Ser. No. 525,815
Int. Cl.[2] B65H *51/26*
U.S. Cl. 214—339 **4 Claims**

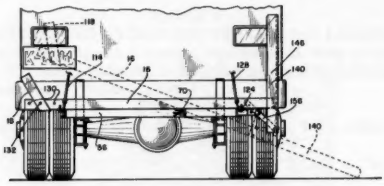


1. A transfer device for a spirally wound tube being fed gradually and continuously from a fabricating device with a helical rotating movement, said transfer device comprising: at least two shafts journalled horizontally and substantially in parallel with each other, support rollers arranged to support the spirally wound tube and loosely fitted to each of said shafts in spaced relation, stoppers on said shafts for positioning said support rollers thereon by engaging one side thereof, tilt adjustment means for said support rollers offset from the axes of said support rollers operative to press the other sides of said support rollers so that the axis of each of said support rollers is inclined relative to the axis of its shaft, wherein said support rollers are loosely fitted to the shafts and serve to support and transfer the spirally wound tube while said support rollers are rotated with a tilt approximately equal to the direction of the helix of the tube which moves axially while it is revolved.

3,921,842
MOTORCYCLE CARRIER ATTACHMENT FOR WHEELED VEHICLE

Floyd R. Campbell, 3736 Salina, Wichita, Kans. 67204

Filed Nov. 22, 1974, Ser. No. 526,179
Int. Cl.² B60R 9/10
U.S. Cl. 214—450 17 Claims

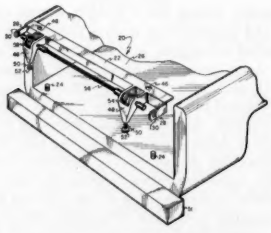


1. A cycle carrier attachment for vehicles comprising a base adapted to be mounted on a vehicle, means mounting the base at one end of the vehicle, an elongated cycle support platform pivotally mounted on the base for tilting movement about a horizontal tilting axis that is transverse to its longitudinal extent, the arrangement being such that the support platform can be tilted from a horizontal transport position to a tilted loading position with such tilting being accompanied by one end of the platform being lowered relative to the base, means for releasably securing the platform in its transport position, an upstanding blocking member is secured to the other end of the platform, an elongated combined blocking and ramp means pivotally mounted on said one end of the platform for swinging movement relative to the longitudinal extent of the platform about a horizontal and transverse axis between an upstanding blocking position and a downwardly inclined ramp position, and means interconnecting the base and the combined means for actuating pivotal movement of the latter in response to pivotal movement of the platform relative to the base, the arrangement being such that the combined means is in its blocking and ramp positions when the platform is, respectively, in its transport and loading positions, whereby the combined means serve as a guide for the wheels of a cycle when serving as a ramp during loading operations and whereby the same is adapted to receive a cycle wheel and to retain the same against lateral dislodgement when serving to block the same against longitudinal movement.

3,921,843
CAMPER LOADING AND SECURING SYSTEM

Reed Rasmussen, 168 W. Gentile, Layton, Utah 84041, and Carl M. Rasmussen, 197 E. 1400 South, Bountiful, Utah 84010

Division of Ser. No. 305,755, Nov. 13, 1972, Pat. No. 3,819,077. This application Nov. 19, 1973, Ser. No. 417,021
Int. Cl.² B60P 3/32
U.S. Cl. 214—516 1 Claim

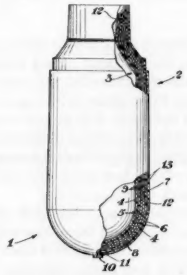


1. In a camper loading and securing system for loading a camper comprising in combination an elongated rack having a plurality of regularly spaced recesses therein, the rack being secured adjacent the bottom of the camper having at least one outwardly projecting detent secured thereto, a camper loading assembly including means for engaging the rack and being releasably secured to the bed of a truck and having at least one coupling means thereon, comprising a rigid, upstanding, interlocking retainer, the retainer comprising means for anchoring the retainer to the truck bed at a location accommodating reception of the coupling means in the camper loading assembly, the retainer being (a) laterally spaced from the rack and in alignment with the detent when the camper is positioned upon the loading assembly and (b) having a notch in one side of the exterior of the retainer, at least a portion of the notch being exposed when the loading assembly is superimposed over the retainer, the notch receiving the detent when the camper is in at least one predetermined position with respect to the interlocking retainer so as to simultaneously restrain both the camper-mounted detent and the camper loading assembly from movement in at least the vertical direction.

3,921,844
HEAT INSULATING CONTAINER HAVING PLASTIC WALLS RETAINING VACUUM

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 305,415, Nov. 10, 1972, Pat. No. 3,828,960. This application Aug. 15, 1974, Ser. No. 497,588
Int. Cl.² A47J 41/02
U.S. Cl. 215—13 R 14 Claims



1. A plastic container having double wall construction capable of retaining a vacuum for a substantial period of time, said container comprising a boundary wall of a normally solid, plastic material enclosing an evacuated space, a layer of metal on at least one surface of said boundary wall, an overcoating of a barrier plastic adherent to the metal layer and a gas-absorbing material residing in the evacuated space, said gas-absorbing material comprising an alkoxide of an alkali metal or alkaline earth metal.

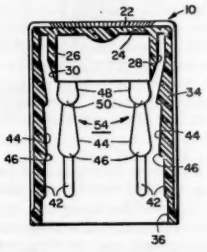
3,921,845
CLOSURE DEVICE OF PLASTIC FOR TUBES AND CONTAINERS

Herman J. Vogel, Jr., Parkersburg, W. Va., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 11, 1972, Ser. No. 314,271
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B65D 41/30, 41/22
U.S. Cl. 215—320 5 Claims

4. A closure device of plastic for tubes, cans, bottles or other containers each having a smooth-walled inner and outer neck or mouth portion, generally cylindrical in shape, said device comprising a cap having:

a. a top wall;
b. an integral annular internal plug member depending from an inner face of said top wall, serving as means to close said container and of a size to make at least an annular line contact with said inner portion; and
c. an outer tubular skirt member concentric with said internal plug member having a slightly larger inner diameter than that of said outer portion and further having a plurality of circumferentially spaced-apart longitudinally extending continuous stepped abutments of varying heights



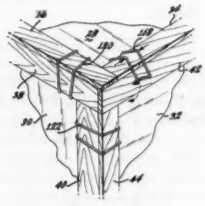
on the inner surface of said skirt member to permit varying degrees of loose and interference fits between said skirt member and said outer portion as said cap is being applied to said outer portion to permit said cap to be used as a loose dust cover and breather cap, a fixed dust cover and breather cap, as well as a fixed dust cover and gas/liquid tight cap, with at least one step of said abutments including a tear-drop shaped area having apex means for deforming a contiguous area of said skirt member lying generally radially outwardly of said tear-drop shaped area.

3,921,846

CLIP FASTENER

John A. Mellott, Rancho Palos Verdes, and Roderick G. Rohrberg, Torrance, both of Calif., assignors to Melmat, Inc., Torrance, Calif.

Filed Sept. 3, 1974, Ser. No. 502,310
Int. Cl.² B65D *9/34*
U.S. Cl. 217—65 **10 Claims**



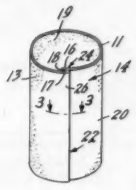
1. A spring wire corner fastener for securing two substantially perpendicularly displaced abutting members having cleats along the outer marginal surfaces including
a pair of spatially displaced L-shaped resilient wire members,
at least a substantial portion of one of the wire members substantially nonparallel to a complementary portion of the other wire member,
each of the wire members including a pair of leg portions and with the leg portions of each wire member disposed substantially perpendicular to each other,
a first contiguous interconnecting wire loop forming continuous extensions of first complementary end portions of the wire members and angularly displaced inwardly relative to the L-shaped resilient wire members, and
a second interconnecting wire loop forming continuous extensions of second complementary end portions of the wire members and angularly displaced inwardly relative to the L-shaped resilient wire members.

3,921,847

CEMENTED LAP SEAM CONTAINER

Kenneth Richard Rentmeester, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 7, 1972, Ser. No. 304,400
Int. Cl.² B65D *25/14*; B32B *1/08*; B65D *23/02*
U.S. Cl. 220—64 **25 Claims**



1. A decorated, tubular, sheet metal can body having opposed longitudinal edges overlapped to form a lap side seam wherein the interior metal surface within the seam is adjacent to and overlaps the opposed exterior metal surface within the seam, the opposed surfaces included within said lap seam having adhered thereto an organic coating comprising an epoxy resin, and an organic adhesive disposed in said lap seam and adhered to the coating on said surfaces, said organic adhesive being a linear superpolyamide having an inherent viscosity of at least 0.4;
the coating on the entire exterior surface being a cured, decorative pigmented organic coating which extends into the lap seam, constitutes a bonding interface for the organic adhesive and an adherent base receptive to printing or other decoration, said cured coating being derived from a composition comprising from about 40 to about 65 parts by weight of a pigment and from about 60 to about 35 parts by weight of non-volatile vehicle comprising an epoxy ether having, before curing, an epoxide equivalent of from 425 to 6,000 and a number average molecular weight of from 1,000 to 4,000 and components coreactive therewith upon application of heat to form an epoxy resin, the epoxy resin thus formed being selected from the group consisting of (1) epoxy-phenolic (2) epoxy-ester and (3) epoxy-amino resins.

3,921,848

AEROSOL DISPENSING AND SIMILAR METAL CANS ADAPTED TO CONTAIN A PRESSURIZED FLUID

Gilbert Dolveck, St. Barthelemy-de-Beaurepaire, France, assignor to Aluminium Suisse S.A., Switzerland

Filed Dec. 3, 1973, Ser. No. 421,109
Claims priority, application Switzerland, Dec. 4, 1972, 17610/72
Int. Cl.² B65D *7/36*, *7/42*
U.S. Cl. 220—67 **4 Claims**

1. A can for containing a pressurized fluid comprising, a tubular body, an inwardly concave bottom having a peripheral outward reverse fold fixed to said body and closing the bottom of said tubular body, said tubular body having a sidewall annular in cross section with a lower marginal portion reversely folded inwardly of the can extending away from a lower fold and including a fold overlapping the outward reverse fold of said bottom and jointly therewith defining a seam axially spaced inwardly from said lower fold fixing the bottom to the tubular body, said lower fold extending radially inwardly of the can body it underlies defining an inner diameter

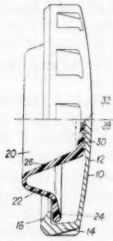
of the lower fold progressively decreasing in a direction away from said bottom, and said bottom having a greater outer

diameter than the minimum inner diameter of said lower fold, whereby said lower fold coacts with said seam in fixing the bottom axially on said body.

3,921,849
SEALING CAPS

Paul C. Fernberg, Farnham Common, and Colin W. F. Clinch, Woodley, both of England, assignors to ITW Limited, Berks, England

Filed Dec. 3, 1973, Ser. No. 420,833
Int. Cl.² B65D *53/00, 51/16*
U.S. Cl. 220—295 **1 Claim**

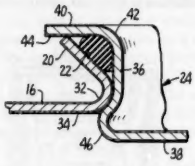


1. A two piece petrol cap assembly for application to the filler neck of an automobile petrol tank, said cap assembly comprising a one-piece overcap body and a one-piece plastic diaphragm, said cap body and diaphragm having mutually cooperating means to permit them to be relatively rotatably coupled together as a unit, said cap body having means adapted to mutually cooperate with securing means on the neck of said petrol tank, said diaphragm being substantially continuous and presenting an annular wall which extends radially outwardly and includes the outer margin of said diaphragm, said diaphragm in its relaxed condition when coupled with said overcap being spaced axially from said cap body in the vicinity of said annular wall, said diaphragm having another wall radially inwardly of said annular wall which extends a substantial distance angularly inwardly relative to the axis of said cap body and capable of being moved radially outward to form a continuous seal against the interior surface of said neck upon mounting of said cap and diaphragm unit on the neck of the petrol tank as said cap is progressively pressed onto the rim of said filler neck of said tank, the seal between the two wall of the diaphragm and the inner surface and rim of the neck being continuously maintained by said securing means operative between said cap head and filler neck, said diaphragm further having means abutting the cap body, said means having a fine labyrinthine passage over its outer surface and a small passage opening through the diaphragm to a radially inner portion of the passage.

3,921,850
DRUM CLOSURE

Joseph E. Powers, Napa, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 423,228, Dec. 10, 1973. This application May 28, 1974, Ser. No. 473,720
Int. Cl.² B65D *39/00*
U.S. Cl. 220—308 **9 Claims**

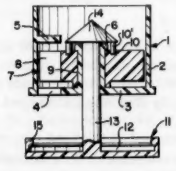


1. A closure for a drum having at least one generally planar end wall with an opening therein, said closure comprising: a portion of said end wall bounding said opening and defining a lip integral with said end wall, said lip extending axially and radially outward around said opening, residing at an acute angle with respect to said planar end wall, being of a single thickness and having all surfaces exposed to the exterior of the end wall, a smooth conical interior surface merging into said opening and an outwardly exposed distal edge, said distal edge being concentric with said opening and residing in a plane substantially parallel with said end wall; a closure plug having a cylindric mid-wall and including an O-ring gasket circumscribing said mid-wall, a circular wall integral with and extending across one end of said mid-wall, and an annular flange integral with and extending outward from said mid-wall at the end of the mid-wall opposite said circular wall, said mid-wall having a diameter sized to fit within said opening and an axial extent such that said circular wall is interior of said drum end wall when said flange is in contact with the distal edge of said lip, said closure plug being deformable so that the portion of said mid-wall adjacent said circular wall can be radially expanded to retain said closure plug in said opening and distort said O-ring gasket into engagement with the smooth conical interior surface of the lip and the surfaces of the closure plug opposed thereto to seal said closure, said plug, lip and O-ring being so proportioned that distortion of the O-ring is within its elastic limit when the flange of the plug is in contact with the distal edge of the lip.

3,921,851
DISABLING DEVICE FOR DISPENSER FOR TABLETS

Billy N. Nilson, Finnstugatan 30, 595 99 Mjolby, Sweden

Filed Feb. 25, 1974, Ser. No. 445,604
Int. Cl.² B65D *83/04*
U.S. Cl. 221—151 **2 Claims**



1. A dispenser for tablets intended to be secured to or integral with a container such as a jar comprising a bottom having an opening for a tablet, a rotatably mounted distributor means positioned above said bottom and provided with at least one opening through which tablets may pass, a covering means positioned above said distributor means and in vertical

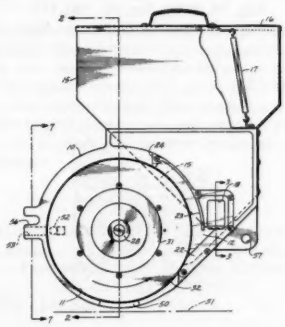
alignment with the dispensing opening of said bottom, said bottom in addition to said dispensing opening having a central opening, a stud extending through said central opening wherein said stud apart from a rotational movement may also perform a displacement movement in its axial direction, said stud having coupling means in the upper part thereof, coupling means on said distributor means capable of engaging said stud coupling means in a first axial position of said stud thereby enabling said distributor means to be rotated by means of said stud and to be out of contact with said coupling means of said distributor means in a second axial position of said stud, said stud in the lower end thereof merging into a cap member of approximately the same diameter as said bottom, said cap member further having an annular upwardly directed flange provided with a bead, said bottom part having a configuration which by a snap action may engage said bead to hold said cap member in a transport and storage position close to and in sealingly engagement with said stud is in said second axial position while said flange in said first axial position of said stud forms a rim to prevent tablets dispensed from the container from leaving said cap member.

3,921,852

PRECISION SEED PLANTER

Lloyd A. Johnson, 3351 N. Raymond, Pasadena, Calif. 91001

Filed Feb. 21, 1974, Ser. No. 444,475
Int. Cl.² A01C 7/12
U.S. Cl. 221—266 **15 Claims**



1. A precision seed planter comprising:

a feed wheel having a thin peripheral flange, the feed wheel rotating about a horizontal axis;

shallow seed carrying pockets in the form of holes extending completely through the flange spaced at intervals along the periphery of the feed wheel, the pockets having sides slanted in the direction of rotation;

a stationary wheel having a peripheral surface directly adjacent the inside of the flange of the feed wheel under the holes to provide a bottom for the pockets;

a seed loading chamber in communication with the periphery of the feed wheel for loading one or more seeds into each pocket in turn passing the chamber during rotation of the feed wheel;

a drive wheel in substantially nonslipping contact with the ground;

means for coupling the drive wheel to the feed wheel to turn the feed wheel at an angular velocity proportional to the angular velocity of the drive wheel;

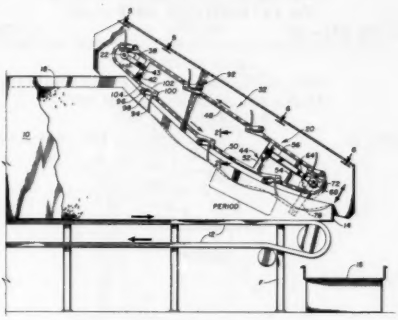
an exit for discharge of seeds from the pockets at a point facing the ground during rotation of the feed wheel; and a seed retaining member having an annular surface closely girding the outside of the flange of the feed wheel along the path of rotation of the feed wheel from the loading chamber to the exit to retain seeds in the pockets.

3,921,853

MOVING GATE DISCHARGE SYSTEM

Ralph D. Burgess, Jr., 2800 Pheasant Road, Excelsior, Minn. 55331

Continuation-in-part of Ser. No. 439,342, Feb. 4, 1974, Pat. No. 3,877,585. This application Dec. 16, 1974, Ser. No. 532,913
Int. Cl.² G01F 11/00
U.S. Cl. 222—1 **22 Claims**



15. A moving gate discharge system for preventing product breakage in discharging particulate products in a uniform flow from a receptacle having a moving bottom comprising:

a. a receptacle having a moving bottom and an ultimate discharge;

b. an inclined elongated feeder mounted across said discharge of said receptacle;

c. said feeder being mounted for movement between an upper and a lower terminal;

d. said feeder having a lower end portion immediately adjacent said ultimate discharge of said receptacle and having its longitudinal axis extending at an angle relative to horizontal which is less than the angle of repose of the particulate product to be discharged from said receptacle;

e. said lower end portion of said feeder being mounted to permit rising and falling action thereof;

f. means for causing said lower end portion of said feeder to rise and fall regularly as said feeder moves;

g. product-progressing tines carried by said feeder at points spaced longitudinally of said feeder and traveling therewith, said tines being constructed and arranged in an out-of-phase relationship with respect to the longitudinal distance said feeder travels as its lower end portion moves through one period of its said rising and falling motion and being spaced a distance somewhat greater than said distance said feeder travels during said motion; and,

h. power means operatively connected to said feeder for causing the same to move longitudinally.

17. A method of causing a uniform flow of particulate products to be discharged from the discharge of a receptacle having a moving bottom supporting and moving a mass of such a product to said discharge consisting in:

a. simultaneously engaging and progressing portions of the particulate product of the mass toward the discharge of the receptacle at a plurality of locations along an undulating path following a general plane extending upwardly and rearwardly from the discharge of the assembly at an angle relative to horizontal less than the angle of slide of such product;

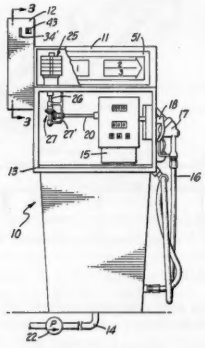
b. sequentially simultaneously engaging and progressing additional portions of the particulate product of the mass toward the discharge of the receptacle at a plurality of locations along a separate and different undulating path out of phase with and trailing said previous path and

following along the same general plane; and,
c. repeating step (b) repeatedly thereafter.

3,921,854
REMOTE CONTROL CONSOLE FOR A PLURALITY OF AUTOMATIC GASOLINE DISPENSERS

Thomas D. Formica, Newport Beach; Robert C. Greenwood, Cypress, and Thomas E. Jones, Costa Mesa, all of Calif., assignors to Pan-Nova, Inc., Santa Fe Springs, Calif.

Filed May 13, 1974, Ser. No. 469,518
Int. Cl.[2] B67D 5/30; G07F 13/00
U.S. Cl. 222—16 **12 Claims**



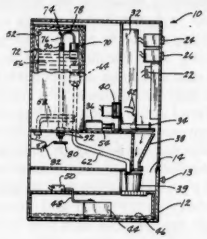
1. In a fluid dispensing system, the combination of:
a plurality of fluid dispensers, each of said dispensers including
means responsive to an input signal for registering a number of units of fluid to be dispensed:
means for registering the number of units of fluid dispensed; means for terminating dispensing when the number of units dispensed matches the number to be dispensed; and means for paying out change when dispensing is terminated and the number of units dispensed is less than the number of units to be dispensed; and
a control unit continuously connected to each of said fluid dispensers, said control unit including
means for generating an input signal corresponding to a number of units of fluid to be dispensed;
means for selecting a dispenser and coupling the input signal to the selected dispenser;
means for initiating operation of said generating means after a dispenser is selected; and
means for blocking further operation of said selecting means after actuation of said initiating means until said generating means input signal has been transmitted to the selected dispenser.

3,921,855
DRINK DISPENSER WITH LEVEL CONTROL FOR SUPPLY TANK

Martelle J. Syverson, Albert Lea, Minn., assignor to Fountain Industries, Inc., Albert Lea, Minn.

Filed Jan. 10, 1975, Ser. No. 540,113
Int. Cl.[2] G01F 23/10
U.S. Cl. 222—67 **3 Claims**

1. A hot drink dispensing machine comprising,
a water tank having a bottom wall,
inlet and outlet valve means connected to said tank,
a float in said tank carried on a rod, said rod having an elongated portion extending from below the tank bottom wall to above the water upper level, said rod including a return bend portion at its upper end and said float being connected to the lower end of said return bend portion, a guide tube open at its top end sealingly connected at its lower end to the bottom wall of said tank and the top end extending above the top water level and said elongated portion of said float rod being positioned in said tube for isolating said rod from the water in said tank, and

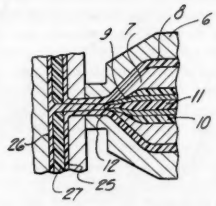


a switch in the path of the lower end of said rod for actuation by said rod as said float moves up and down with the rise and fall of water in said tank and said switch being operatively connected to said inlet valve.

3,921,856
INJECTION MOLDING NOZZLE

Erhard Langecker, Hohbuschener Weg 5, 5882 Meinerzhagen 1, Germany

Division of Ser. No. 399,960, Sept. 24, 1973. This application Aug. 28, 1974, Ser. No. 501,177
Claims priority, application Germany, Sept. 27, 1972, 2247995
Int. Cl.[2] B29F 1/03
U.S. Cl. 222—132 **3 Claims**



1. An injection nozzle comprising an outer sleeve the interior of which tapers down to a conical exit opening for communicating with a sprue channel of a mold;
an interior sleeve defining with the outer sleeve an outer annular channel which ends in an annular exit opening, the internal sleeve having a passage which tapers down to a second conical opening defining a valve seat;
a cylinder coaxially movable within said passage and so arranged that it forms an inner annular channel which may be closed by the engagement of said cylinder with said valve seat;
the outer annular channel, the inner annular channel, and the interior of said cylinder being connectable to a source of plastic material.

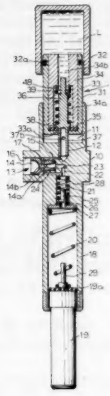
3,921,857
NON-SPITTING LIQUID DISPENSING DEVICE

Pasquale R. Riccio, Salem, N.H., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 29, 1973, Ser. No. 419,966
Int. Cl.[2] B67D 5/54
U.S. Cl. 222—145 **5 Claims**

1. A device for dispensing a spray of the fine droplets of liquid in gas, comprising a dispenser body, said dispenser body having a nozzle means opening out of said body and having a

central Venturi passage therethrough and lateral passages opening into said Venturi passage, said dispenser body having an annular mixing chamber around said central passage to which said lateral passages are connected, a source of liquid to be dispensed having means for mechanically pressurizing said liquid and operatively associated with said dispenser body valve means controlling dispensing of liquid from said source; said dispenser body having a product flow conduit therethroug



from said valve means for said source of liquid to said annular mixing chamber and a source of gas under pressure and opening axially into the central Venturi passage of said nozzle means, and a branch compressed gas flow conduit branching from said main compressed gas flow conduit and opening into said annular mixing chamber at a point spaced from the point at which said product flow conduit opens into said annular mixing chamber.

3,921,858

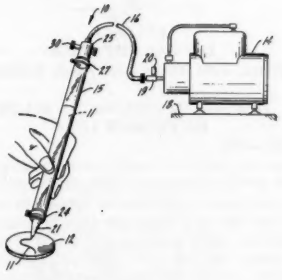
AUTOMATIC CONFECTION DECORATING SYSTEM

Robert A. Bemm, 1241 Swainwood Drive, Glenview, Ill. 60025

Filed Nov. 5, 1973, Ser. No. 412,651

Int. Cl.² B67D *5/42, 5/54*

U.S. Cl. 222—146 HE **11 Claims**



1. An apparatus for decoratively applying pastes to bakery products, confections, and the like comprising an elongated tube defining an elongated air pressure chamber a length of which is pre-filled with a determined quantity of paste, a discharge nozzle at one end of said tube, air pump means, means connecting aid air pump means to the opposite end of said tube for directing air under pressure into said chamber and against one end of the said quantity of paste contained therein for moving said quantity of paste along the length of said tube and extruding a portion thereof out of said discharge nozzle without substantial intermixture of said air and paste, selectively operable valve means for controlling the discharge of said paste from said nozzle under force of said air pressure, and said elongated tube having strength sufficient to withstand said internal pressure without substantial radial deformation while being sufficiently flexible to permit the nozzle end to be moved relative to the opposite end thereof to permit decorative application of said paste from said nozzle while said opposite end is held stationary.

3,921,859

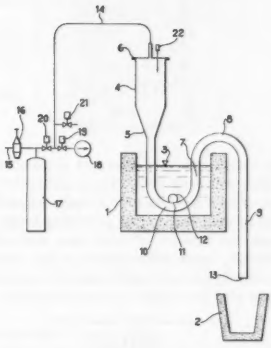
SIPHON FOR MOLTEN METALS WITH SUCTION ACTUATOR

Piero Colombani, 6/1 Via Fiordalisi, Milan, Italy

Filed Jan. 24, 1974, Ser. No. 436,335

Int. Cl.² B22D *37/00*

U.S. Cl. 222—204 **11 Claims**



1. A liquid transferring device for transferring high temperature liquids, contained at a given level in a first container, to a second container located at an elevation lower than such given level, said device comprising, in combination, an inverted U-shaped liquid-transferring siphon pipe, having a rising length and a descending length extending from the bight of its inverted U-shape, positioned with its rising length in said first container and its descending length extending downwardly toward said second container with an outlet end at an elevation below such given level; said rising length communicating with the liquid level in said first container at a liquid inlet opening at a level below such given level; a gas-tightly sealed crucible vessel having a bottom inlet in fluid-tight communication with said rising length and communicating with said liquid inlet opening; and pneumatic pressure applying means communicating with said crucible vessel at its upper end and selectively operable to selectively apply either a negative or a positive pressure controllably to liquid in said siphon pipe to prime said siphon pipe for transfer of liquid from said first container to said second container.

3,921,860

LIQUID DISPENSING CUP FOR FLEXIBLE CONTAINER

Eli A. Zackheim, Norwich, Conn., assignor to Jules Silver, Norwich, Conn.

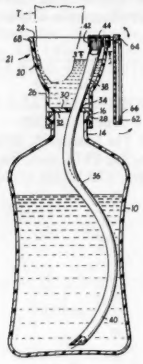
Continuation-in-part of Ser. No. 99,582, Dec. 18, 1970, abandoned. This application Apr. 19, 1974, Ser. No. 462,572

Int. Cl.² B65D *37/00*

U.S. Cl. 222—207 **19 Claims**

1. An open top dispensing cup suitable for use in teat treatment and adapted to be secured to the open neck of a flexible container having a supply of teat treating liquid therein, said cup comprising a liquid receptacle portion having an open top and a continuous peripheral sidewall tapering from said open

top to a smaller bottom end portion adapted to be secured to the neck of said container; said receptacle portion having a bottom wall in said bottom end portion and said bottom wall having an opening formed therein; a flexible tubs extending through said opening and having a first end portion located within said receptacle portion adjacent said open top and a second end portion located in said flexible container; and an



outlet plug inserted in said first end portion of the flexible tube, said plug including means for securing the plug and first end portion of said flexible tube to said sidewall and at least one channel formed therein for providing liquid communication between the interior of said tube and said receptacle portion, whereby upon deformation of the walls of the container inwardly liquid is forced from said container, through said tube and plug into said receptacle portion of the cup.

3,921,861

PRESSURE ACCUMULATIVE SPRAY DEVICE

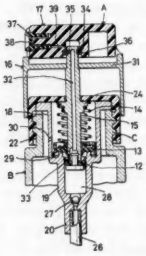
Hirosi Kondo, 30-4, Hanazono-cho, Nagasaki, Nagasaki, Japan

Filed Aug. 20, 1974, Ser. No. 499,036

Claims priority, application Japan, May 17, 1974, 49-56035

Int. Cl.³ B05B *9/04*; G01F *11/02*

U.S. Cl. 222—257 **3 Claims**



1. A pressure accumulative spray device comprising a cylindrical body having an upper cylindrical chamber and a lower cylindrical chamber in communication with said upper cylindrical chamber, said upper cylindrical chamber having a larger diameter than said lower cylindrical chamber, a dip tube opening into the lower cylindrical chamber, a check valve between said dip tube and said lower cylindrical chamber for admitting liquified substance from the dip tube into the lower cylindrical chamber only, a piston rod extending through said two cylindrical chambers and extending outside of said cylindrical body, a first piston secured to the lower end of the piston rod and slidable within the lower cylindrical chamber and having a packing thereon for permitting the liquified substance to flow past said first piston during downward movement of said first piston, a second piston slidable in sealing relationship within said upper cylindrical chamber and around said piston rod, a seat on said piston rod, a first spring around said piston rod between said seat and said second piston, a second spring around said piston rod between the upper end of said upper cylindrical chamber and said second piston, said piston rod having an axial passage therethrough and having an opening in the lower part thereof opening into said upper chamber below said second piston, a spray button on the upper end of said piston rod, valve means between said piston rod and spray button and openable to place the axial passage in communication with said spray button in response to downward axial pressure on said spray button, and means on said piston rod for vertical manipulation of said piston rod independently of said spray button.

3,921,862

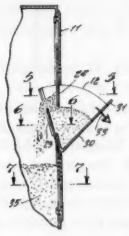
MEASURING POUR SPOUT

Rodger L. Holmstrom, 6204 Beechwood Ave., Sarasota, Fla. 33581

Filed Aug. 22, 1974, Ser. No. 499,519

Int. Cl.³ G01F *11/26*

U.S. Cl. 222—305 **33 Claims**



1. A measuring pour spout assembly for a container comprising in combination, a wall member having an opening therethrough, a measuring pour spout disposed in said opening and mounted for movement in and out with respect to said member, said spout comprising a movable wall disposed on one side of said member, said wall having an upper edge, and selective means to move said spout wall for adjusting the height of said upper edge with respect to said spout bottom.

3,921,863

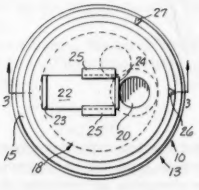
JAR CAP DISPENSER

Irene P. Welch, 2001 Maple Glen Road, Sacramento, Calif. 95825

Filed Nov. 12, 1973, Ser. No. 414,686

Int. Cl.³ G01F *11/24*

U.S. Cl. 222—370 **1 Claim**



1. A jar cap dispenser for use with a jar of the type having an externally threaded neck comprising an internally threaded ring adapted to screw onto said externally threaded neck, a circular wall formed on the upper end portion of said ring and having an aperture formed off center there, an annular flange

formed on and extending above said wall and having its upper edge sloping inwardly, a generally cylindrical body on said wall, an annular shoulder extending outwardly of the bottom portion of said body and engaging under the inwardly sloping portion of said flange supporting said body for axial rotation on said wall, an elongate discharge passageway formed off center in and extending completely through said body and adapted to coextensively register with the aperture in said wall at one point of rotation of said body with respect to said wall, a manually movable slide cover for the upper end of said passageway and a pair of spaced parallel guide rails secured to said body and overlying opposite side edges of said slide for supporting said slide cover for sliding movement to cover and uncover said passageway whereby said passageway may be filled by inverting said jar with said aperture and said passageway in register and said slide closed, said body may be then rotated to move said passageway out of register with said aperture and said slide cover opened to dispense the contents of said passageway.

3,921,864

SYRINGES FOR MAKING PRECISION VOLUME MEASUREMENTS

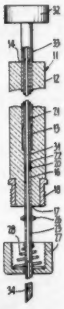
Ernest Frederick Dawes, 99 Kilby Road, East Kew, Victoria, Australia

Filed Sept. 20, 1973, Ser. No. 399,344

Claims priority, application Australia, Sept. 22, 1972, 533/72

Int. Cl.[3] A61M *5/315, 5/34*

U.S. Cl. 222—386 **7 Claims**



1. A syringe comprising a barrel, a main bore in the barrel opening at one end thereof, a needle receiving bore in the other end of the barrel substantially coaxial with the main bore and communicating therewith, a hollow needle removably engaged in the needle receiving bore, a syringe plunger extending through the main bore and the needle receiving bore to precisely engage within the hollow needle, sealing means in said needle receiving bore and including a resilient seal through which the plunger slidably moves, and means holding the needle in the needle receiving bore with the inner end of the needle in sealing engagement with said resilient seal, said means comprising a threaded boss on the end of the barrel, an internally threaded nut engaged with the boss the nut having an aperture through which the needle extends, shoulder means on the needle and a tapered helical spring acting between the nut and the shoulder means to resiliently urge the needle into sealing engagement with the seal.

3,921,865

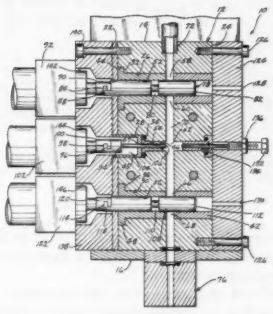
METERING VALVE

Robert F. Klug, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed Jan. 30, 1975, Ser. No. 545,304

Int. Cl.[2] G01F *11/38*

U.S. Cl. 222—447 **9 Claims**



1. A metering valve, comprising,

a housing having upper and lower ends and opposite sides, said housing having a first bore formed therein which extends between its upper and lower ends,

means fluidly connecting the upper end of said first bore to a source of material to be metered,

means at the lower end of said first bore for discharging the metered material therefrom,

said housing having spaced apart upper, intermediate and lower bores formed therein disposed perpendicularily with respect to said first bore and communicating therewith,

upper, intermediate and lower pistons movably mounted in said upper, intermediate and lower bores respectively,

upper, intermediate and lower power cylinders operatively connected to said upper, intermediate and lower pistons respectively for moving each of said pistons between first and second positions relative to the respective bores,

said upper piston having a cut-away portion formed in its periphery between the ends thereof which communicates with said first bore when said upper piston is in said first position to permit the flow of material in said first bore past said upper piston,

said lower piston having a cut-away portion formed in its periphery between the ends thereof which communicates with said first bore when said lower piston is in said first position to permit the flow of material in said first bore past said lower piston,

said upper and lower pistons each having piston portions thereon which seal said first bore when said pistons are in their said second positions,

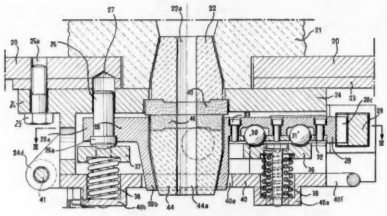
said intermediate piston being positioned in said intermediate bore, when in its said second position, in a spaced relation with respect to said first bore and being moved towards said first bore when moving from its said second position to said first position,

and control means for operating said power cylinders.

3,921,866
ANGULARLY MOVABLE OBTURATOR, PARTICULARLY FOR CONTROLLING MOLTEN METAL FLOW FROM CONTAINERS OR LADLES

Ferdinando Palazzo, C. So Massimo d'Azeglio, 12, Torino, Italy

Filed June 5, 1974, Ser. No. 476,364
Claims priority, application Italy, Oct. 16, 1973, 70045/73
Int. Cl.² B22D *37/00*, *41/08*
U.S. Cl. 222—512 15 Claims



1. An obturator for controlling the flow of molten metal through an opening in the bottom of a container for such metal, the obturator comprising:

a. a support fixed with respect to the container,

b. a plate having an aperture which can be brought into alignment with the opening in the container, to allow molten metal flow from the container, or alternatively moved out of alignment with the opening to terminate such flow,

c. a vertical pivot pin horizontally spaced from said aperture and extending between said plate and support, said pin being slidably and rotatably accommodated in said support, said plate being pivotable about the axis of said pin,

d. a cap beneath said plate and carried by said support,

e. resilient means between said cap and pin urging said pin and plate toward said support,

f. resilient means between said cap and a point on said plate which is on a side of the aperture in said plate opposite said pin, said resilient means urging said plate toward said support, and

g. means for pivoting the latter about said pin between a position in which said aperture is aligned with the opening in the container and a position in which said aperture is out of alignment with the opening in the container.

3,921,867
PACK FRAME STRAP CONNECTION MEANS

Frederick A. Farnbach, Phoenix, Ariz.

Filed Sept. 14, 1972, Ser. No. 288,966
Int. Cl. A45f *3/10*
U.S. Cl. 224—25 A 5 Claims

1. In a strap connection means for pack frames, the combination of:

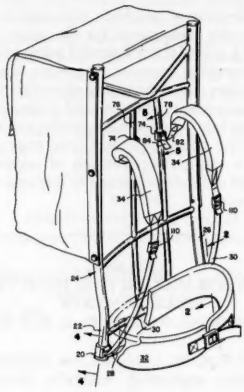
a pack frame provided with a hollow tubular structural member at a normally lower portion of said frame;

a strap connector body coupled to said pack frame, said body defining a bore therethrough with said structural member extending within said bore, said connector body having a slot therein;

a folded strap disposed within said slot and having a generally U-shaped folded loop portion disposed at one end of said slot, with two strap portions extending from the other end of said slot in said connector body;

a retainer member disposed within said loop portion, the aggregate dimensions of said loop portion and said retainer member being greater than the breadth of said slot thereby locking said folded strap and loop shaped portion thereof in said slot with said folded strap and loop portion thereof pulled into said slot in a direction tending to force said retainer member toward said slot;

a shoulder engaging strap connected to one of said strap portions extending from said slot; and

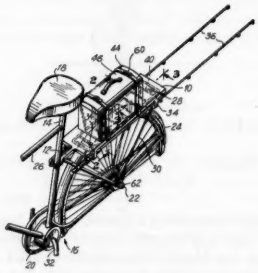


a hip engaging belt coupled to the other one of said strap portions extending from said slot.

3,921,868
BICYCLE RACK

Hyman Reichbach, R.F.D No. 1, Hilda Drive, Mahopac, N.Y. 10541

Filed Aug. 5, 1974, Ser. No. 494,478
Int. Cl.² B62J *11/00*
U.S. Cl. 224—32 A 5 Claims

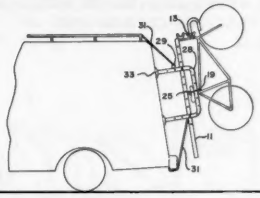


1. A rear-fender cycle rack for attachment to a cycle vehicle having a seat supporting pole and for supporting fishing equipment comprising a platform for generally horizontal orientation, a bracket for attachment of said platform to said seat supporting pole for stabilizing said platform, V-slot bracket means attached to said platform for attachment to and support of a pole-like object to extend generally horizontally and rearwardly with respect to said seat supporting pole and for preventing said object from extending forwardly of said seat supporting pole.

3,921,869
BICYCLE CARRYING RACK

Winston L. Rogers, P.O. Box 206, Rheem Valley, Calif. 94570

Filed May 6, 1974, Ser. No. 467,104
Int. Cl.² B60R 9/10
U.S. Cl. 224—42.03 B 7 Claims



1. A bicycle carrying rack for mounting on an automobile comprising

an inverted U-shaped carrying frame the U-shaped frame having a horizontal bar portion;

a multiplicity of bicycle handle bar engaging bracket pairs, each pair for supporting a bicycle, secured to the horizontal bar portion of said carrying frame, each of said bracket pairs being offset in the direction of the longitudinal axis of the vehicle with respect to adjacent bracket pairs whereby the adjacent handle bars of adjacent bicycles may be laterally nested in a close arrangement rather than arranged apart in abutting relation,

an intermediate cross bar member horizontally disposed between the leg portions of said inverted U-shaped carrying frame for supporting the seats of said bicycles and means securing the cross bar relative to said carrying frame whereby the bicycles carried on said carrying frame project perpendicularly outward from the automobile in a closely spaced parallel relationship,

means for securing the bicycle seats to said cross bar member,

means for mounting said carrying frame to the rear portion of said automobile in an approximately vertical upright position,

said means for mounting said carrying frame to an automobile includes a mounting frame fixably adaptable to the rear portion of automobiles having different inclinations such as a vertical back, a slant back, or a horizontal back, said mounting frame having a means for adjustably engaging the leg portions of said inverted U-shaped carrying frame and securing the same to said mounting frame whereby the attitude of said carrying frame can be varied with respect to said mounting frame depending on the inclination of the rear surface of the automobile to which said mounting frame is attached, and

wherein said bicycles are supported on the rack by their handle bars and seats with the longitudinal axis of the bicycle in a substantially vertical position.

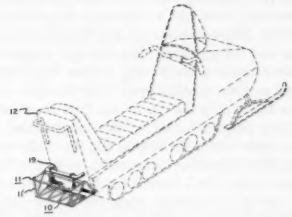
3,921,870
COMBINATION CARRIER AND LATCH

Richard H. Camp, Box 1177, Haines, Oreg. 97833

Filed May 11, 1973, Ser. No. 359,378
Int. Cl. B60m 11/00
U.S. Cl. 224—42.07 1 Claim

1. In the combination of a lock latch for demountably securing a carrier to a vehicle, said vehicle carrier having a frame including a pair of horizontal rectilinearly disposed side bars, a pair of upper side bars disposed distally above said lower side bars, a plurality of corner bars which are fastened to the respective terminal ends of said upper and lower side bars, a horizontally, transversely disposed bar fastened between the forwardmost terminal ends of said upper side bars and having a lattice-like carrier floor fastened to said lower side bars, the improvement comprising:

a pair of bar lugs each engaging a lifting bar provided at the rearward end of said vehicle, each bar lug being fastened distally from the terminal ends of said horizontal transverse bar, said bar lugs including a substantially C-shaped mounting bracket engageable with said lifting bar which is fastened upstandingly to the uppermost terminal side to said horizontal transverse bar and with its opening disposed away from the adjacent terminal side of said carrier, and a substantially inverted J-shaped lock lug carrier by a hollow cylindrical collar fastened upstandingly to said horizontal transverse bar adjacent said C-shaped bracket, said lock lug being urged downwardly by a coil spring disposed about the leg of said lock lug to engage said lub with said lifting bar; and

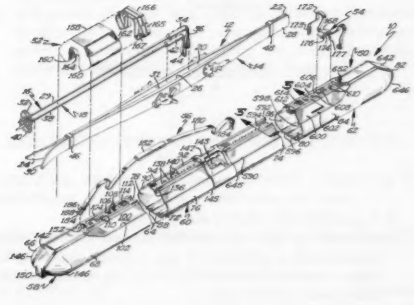


a pair of frame lugs engaging a frame portion of said vehicle, each of said lugs being fastened to the interior vertex of said corner bar and said lower side bar on the side of said carrier adjacent said horizontal transverse bar, each of said frame lugs including a hollow cylindrical collar fastened substantially horizontally to said vertex of said corner bar and said lower side bar, a substantially J-shaped lock lug carried by its leg in said collar with its opening disposed toward the rectilinear center and with its crook disposed away from the transverse center of said carrier to engage said lock lug to said frame, said lock lug being urged centrally in said collar by a coil spring disposed about the leg of said lock lug to engage said lock lug with said frame.

3,921,871
SKI STORING, PROTECTING, AND CARRYING APPARATUS

Charles W. Heil, 800 Ottawa Ave., St. Paul, Minn. 55107

Filed Dec. 16, 1974, Ser. No. 532,892
Int. Cl.² B65D 7/24
U.S. Cl. 224—45 S 65 Claims



1. Apparatus for storing, protecting, and carrying a first snow ski and a second snow ski with the first snow ski having a bottom surface, an end, and a tip formed on the forward portion of the snow ski and curved from the bottom surface and with the second ski having a bottom surface, an end, and

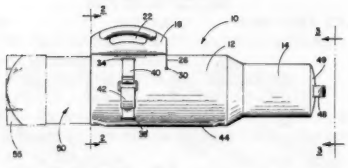
a tip formed on the forward portion of the snow ski and curved from the bottom surface with the bottom surface of the first ski adjacent to the bottom surface of the second ski, comprising in combination: a rigid, hollow, thin-walled elongated container having a first closed end and a second closed end spaced from the first closed end, with the container also including at least a first portion and a second portion being in a telescopic relation; and means for telescopically capturing the first and second snow skis within the container when the second portion is telescoped with the first portion to prevent longitudinal movement of the first and second snow skis within the container and for allowing the container to be used for several length of skis, comprising: first means for engaging and holding the end of the first snow ski; second means for engaging and holding the end of the second snow ski; and third means for retaining the tip of the first snow ski and the tip of the second snow ski to prevent latitudinal movement in a direction perpendicular to the longitudinal axis of the container and for centrally aligning the forward portions of the first and second snow skis within the container when the second portion is telescoped with the first comprising: fourth means for urging the tip of the first snow ski in a latitudinal direction perpendicular to the longitudinal axis of the container; fifth means for urging the tip of the second snow ski in a latitudinal direction perpendicular to the longitudinal axis of the container; sixth means for limiting movement of the first snow ski in a direction opposite to the latitudinal direction which the first snow ski is urged by the fourth urging means; and seventh means for limiting movement of the second snow ski in a direction opposite to the latitudinal direction which the second snow ski is urged by the fifth urging means to thereby removably capture the first and second snow skis within the container when the second portion is telescoped with the first portion to prevent the skis from bouncing, rattling, or moving inside the container during transit.

3,921,872

GAS CYLINDER CARRIER

Clarence E. Buell, Jr., P.O. Box 9826, South Lake Tahoe, Calif. 95731

Filed Apr. 23, 1974, Ser. No. 463,297
Int. Cl.² B65D *87/06*
U.S. Cl. 224—45 R **14 Claims**



1. A gas cylinder carrier, comprising:

a substantially rigid cylindrically-shaped member, sized to enclose only a portion of a gas cylinder, including a plurality of axially directed belt-receiving slots circumferentially positioned therein;

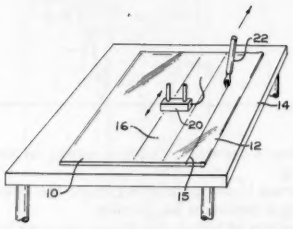
a belt positioned in said slots and extending inside of said cylindrically-shaped member substantially along the chords defined between opposing slots of said member and outside of said member between the ends of said chords, and including means for tightening said belt to clamp said cylinder within said member.

3,921,873

METHOD FOR TRIMMING GLASS

John R. Dahlberg, Jeannette, and Robert H. Grove, Sarvar, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 7, 1973, Ser. No. 422,949
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B26F *3/00*
U.S. Cl. 225—2 **13 Claims**



1. A method of cutting a piece of glass along an intended path of cut substantially parallel to an edge portion which exhibits preformed internal stresses which are compressive relative to the stresses in the main body of the piece comprising:

heating a band of the piece parallel to said edge portion and spaced from the intended path of cut in the direction away from said edge portion so as to effect a relaxation of the stresses in said edge portion; and

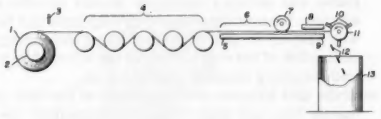
severing the piece along said intended path of cut before the heating effects dissipate from said band.

3,921,874

METHOD OF PREPARING SHORT FIBERS OF FINE DIAMETERS

Raymond G. Spain, 4805 Metcalf Drive, Raleigh, N.C. 27612

Filed Sept. 4, 1973, Ser. No. 394,338
Int. Cl.² B26F *3/00*
U.S. Cl. 225—4 **3 Claims**



1. A method for preparing short fibers of controllable lengths of multifilament bundles of fine diameter individual filaments comprising the steps of:

impregnating the multifilament fiber bundles with a fiber inert liquid material;

tensioning the impregnated multifilament fiber bundles to achieve a high degree of fiber collimation;

freezing the impregnating liquid to form a solid composite comprised of the multifilament fiber bundles and a matrix of the frozen impregnating liquid;

mechanically advancing the said solid composite beyond a cutting edge at a predetermined rate and severing the said solid composite incrementally to provide predetermined lengths of said solid composite;

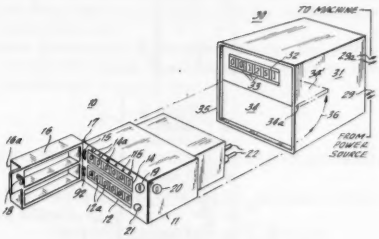
thawing the frozen impregnating liquid; and

removing the impregnating liquid from the composite to provide plural fibers of desired length.

3,921,875
CONTROL DEVICE

Heinz Hengstler, Oakhurst, and Robert M. Groll, Freehold, both of N.J., assignors to Hecon Corporation, New Shrewsbury, N.J.

Continuation of Ser. No. 42,283, June 1, 1970, abandoned. This application May 12, 1972, Ser. No. 252,842
Int. Cl.[2] G06M 3/02; G07C 3/10
U.S. Cl. 235—92 CT 1 Claim



1. Control means for preventing unauthorized use of a machine controlled by an electric power source and for limiting the amount of such authorized use comprising:

a control device including first means coupled between the electric power source and the machine and being movable between a first position disconnecting said machine and said source and a second position for connecting said machine and said source;

second means for normally maintaining said first means in said first position;

normally deenergized third means for operating said first means to said second position when energized;

said third means including a receptacle;

an electrical key device mounted within a tamper-proof housing and having circuit establishing means keyed to be removably inserted into said receptacle for energizing said third means;

first counter means mounted within said key device, said first counter means including altering means for changing the count of said counter means;

settable means within said housing for presetting the counter means to any predetermined count;

latch means on said housing for preventing access to said settable means;

manually operable means in said housing accessible only upon operation of said latch means for substantially instantaneously resetting said first counter to the count set in said counter by said settable means;

pulsing means in said control device for energizing said altering means when said machine is energized to record the amount of use of the machine;

said circuit establishing means including sensing means for deenergizing said third means when a predetermined amount of use of the machine has been sensed;

said first counter means comprising an electrolytic cell;

said sensing means comprising means for sensing the state of said electrolytic cell;

means external of said housing releaseably connected to said electrolytic cell for plating the cell by a predetermined amount;

said settable means further including

signal generating means for generating a signal to be coupled to said cell;

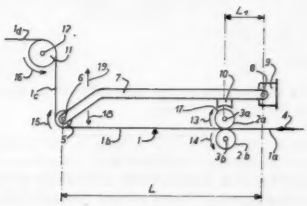
adjustable means connected to said signal generating means for controlling the time duration of said signal to control the amount of plating;

said setting means further comprising a tamper-proof recording means for recording the amount of plating set into the cell.

3,921,876
DEVICE FOR REGULATING THE TENSION IN WEBS OF MATERIAL

Louis Corse, 6, rue Auguste Rodin, La Source B.P. 6049-45018 Orleans-Cedex, France

Continuation of Ser. No. 378,247, July 11, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,914
Claims priority, application France, July 11, 1972, 72.25088
Int. Cl.[2] B65H 25/04
U.S. Cl. 226—39 2 Claims



1. A device for regulating tension in a web of sheet material comprising:

a. a pair of opposed rolls making frictional contact with a web of sheet material traveling in a longitudinal direction thereof and passing between said pair of opposed rolls;

b. a pivoted lever having one end thereof disposed on a pivot axis, said pivot axis being disposed upstream of said pair of opposed rolls relative to the direction of travel of said web of sheet material, said pivoted lever extending in the direction of travel of said web of sheet material and having a bent end portion remote from said pivot axis and bent toward said web of sheet material whereby said pivoted lever remains in use subsantially parallel to said web of sheet material;

c. a gravity-biased roller disposed on the bent end portion of said lever downstream from said pair of opposed rolls and bearing against said web of sheet material under the influence of gravity;

d. a brake shoe disposed on said pivoted lever adjacent an upper one of said opposed rolls for applying a braking force thereto, said braking force having a magnitude determined by said gravity-biased roller sensing tension in said web of sheet material and changing position in response to changes in said tension to change said braking force applied to said pair of opposed rolls thereby regulating said tension in said web; and

e. a third roll disposed to change the direction of advance of said web by about ninety degrees as it passes over said gravity-biased roller to maximize the change in braking force in response to a change in said tension.

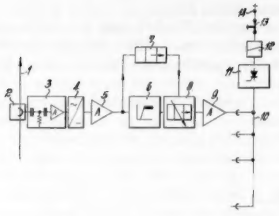
3,921,877
ELECTRONIC THREAD MONITOR FOR TEXTILE MACHINES

Walter Gith, Monchen-Gladbach, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Dec. 5, 1973, Ser. No. 421,782
Claims priority, application Germany, Dec. 5, 1972, 2259389
Int. Cl.[2] B65H 25/32
U.S. Cl. 226—43 5 Claims

1. In electronic thread monitor means for textile machines of the type having a sensing element influenced by the thread motion, means for converting the mechanical quantities into electrical quantities which serve to actuate the shut-off device of the textile machine if these electrical quantities exceed or fall below a predetermined response value during a predeter-

mined time shut-off threshold interval; means responsive to the electrical quantities generated by the sensing element to



change the shut-off threshold time interval inversely proportionally to the thread velocity.

3,921,878

APPARATUS FOR REMOVING EXPOSED FILMS AND BACKING STRIPS FROM CASSETTES

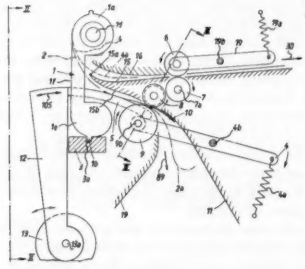
Helmut Zangenfeind, Puchheim, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 21, 1973, Ser. No. 399,506

Claims priority, application Germany, Sept. 22, 1972, 2246671

Int. Cl.² G03B 1/56

U.S. Cl. 226—91 **12 Claims**



1. Apparatus for removing films and backing strips from containers of the type wherein a casing of the container is provided with registering first and second openings and at least the leader of convoluted backing strip is located between the openings, comprising a pusher movable forwardly and backwards along a predetermined path; locating means arranged to support the casing of a container in such position that the openings of the casing are located in said path whereby said pusher passes, during the forward movement thereof, first through one and thereupon through the other opening of the casing which is supported by said locating means and expels the leader of the backing strip through the other opening; advancing means located behind the other opening of the casing which is supported by said locating means and arranged to automatically engage the expelled leader of the backing strip and to advance the thus engaged backing strip lengthwise to thereby draw the film from the casing through the intermediary of the backing strip, said advancing means comprising first and second rotary members located at the opposite sides of said path, one of said rotary members having a peripheral groove which receives a portion of said pusher during forward movement of said pusher; and guide means defining a channel for the leader of the backing strip, said guide means having an inlet located behind said rotary members as considered in the direction of lengthwise movement of the backing strip.

3,921,879

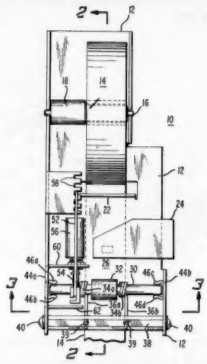
WEB ADVANCE MECHANISM

Kenneth Donald Peters, Jupiter, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,406

Int. Cl.² B65H 17/22

U.S. Cl. 226—148 **6 Claims**



1. Mechanism for advancing a web comprising, in combination:

a shaft having a friction surface;

means for rotating said shaft about its axis;

spring means wound in cylindrical fashion through which said shaft passes, said spring means having a tail portion extending substantially normal to the axis of said shaft; and

means for applying torque to said tail portion for urging said friction surface of said rotating shaft into contact with said web far advancing the same.

3,921,880

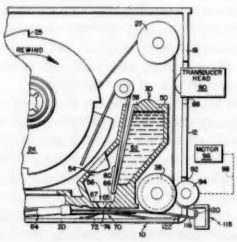
MULTIPURPOSE AUDIO-VISUAL CASSETTE WITH ISOLATION LOOP

Donald T. Scholz, Watertown, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 374,507, June 28, 1973, Pat. No. 3,850,512. This application July 2, 1974, Ser. No. 485,219

Int. Cl.² B65H 17/22

U.S. Cl. 226—181 **2 Claims**



1. Sound recording and playback photographic apparatus for driving and guiding a strip of photographic film along a given path, said apparatus comprising:

a first roller for guiding said film strip along at least a portion of said given path, said first roller being mounted for free rotation about its axis and configured to engage said film strip at only the outer edges of one side of said film strip, said first roller including a central recessed hub portion, a pair of circular end portions and a pair of

flanges formed about said central recessed hub portion proximate said pair of circular end portions, whereby the central portion of said one side of said film strip is free from engagement with said film roller;

a second roller mounted for selective displacement from a position spaced from said film strip into a position wherein it engages said film strip and presses said film strip against said first roller, said second roller being configured with a width substantially equal to the width of said film strip, said drive roller engaging said film strip along the outer portions of the other side of said film strip and being free from engagement with any portion of said first roller; and

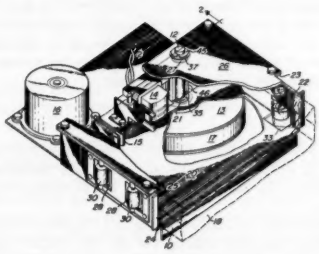
means disassociated from said first roller for driving said second roller to cause said film strip to be drawn between said first and second rollers.

3,921,881

TWO PIECE SHEET METAL CAPSTAN HOUSING ASSEMBLY

Donald J. Dattilo, Mount Prospect, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed May 13, 1974, Ser. No. 469,203
Int. Cl.² B65H *17/20*
U.S. Cl. 226—194 **6 Claims**



1. A capstan housing assembly in a tape player device of the type using an exchangeable cartridge including in combination:

a capstan shaft,

first and second capstan bearings for supporting said capstan shaft,

a cartridge support member having a support wall and a first and second sidewalls spaced apart and integrally formed with said support wall to define a cartridge receiving chamber, said support wall having an opening therein adapted to receive said first capstan bearing, and said first and second sidewalls having flange portions integrally formed thereto and extending outwardly in a plane perpendicular to said sidewalls, said first capstan bearing being supported by said support wall in said opening thereof,

a support plate having an opening therein aligned with said opening in said cartridge support member and adapted to receive said second capstan bearing, said cartridge support member and said support plate being mounted together by connection of said support plate to said flange portions of said first and second sidewalls, said second capstan bearing being supported by said support plate in said opening thereof, said support plate being precisely positioned with respect to said cartridge support member to thereby accurately align said first and second capstan bearings, and

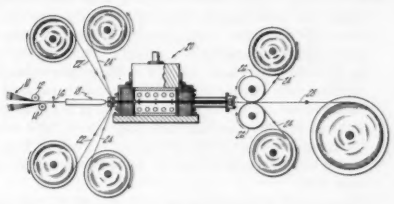
said capstan shaft being supported by said bearings, whereby said capstan shaft is held in a predetermined location with respect to the cartridge receiving chamber.

3,921,882

COLLIMATOR FOR FILAMENTS OF HIGH MODULUS

Charles E. Shulze, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 25, 1974, Ser. No. 518,033
Int. Cl.² B65H *23/04*
U.S. Cl. 226—196 **10 Claims**



1. Apparatus for arranging filaments having a modulus of elasticity in excess of 40×10^6 in a parallel spaced relationship comprising:

at least a first collimator member, said member defining at least a first planar surface with a first plurality of elongated parallel grooves therein, said grooves of said first plurality being at least as deep as the diameter of said filaments, said grooves of said first plurality being spaced by a distance in excess of the diameter of said filaments; and

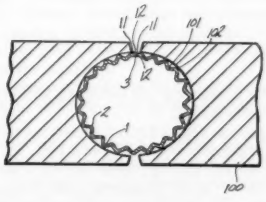
means defining at least a second plurality of elongated parallel grooves, said grooves of said second plurality being equal in dimensions and spacing to said grooves of said first plurality, individual grooves of said second plurality being vertically and transversely offset from individual grooves of said first plurality, said first member and said means defining said second plurality of grooves being arranged to deliver filaments passing through said grooves to spaced points along a common line.

3,921,883

APPARATUS FOR MAKING WELDED CORRUGATED TUBE

Charles D. McLain, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 343,277, March 21, 1973, abandoned, which is a division of Ser. No. 218,422, Jan. 17, 1972, abandoned. This application June 10, 1974, Ser. No. 477,683
Int. Cl.² B23K *1/20*
U.S. Cl. 228—17.5 **9 Claims**



1. An apparatus for continuously forming a heat exchanger tube, said apparatus comprising:

a supply of substantially flat elongated metal strip having opposed longitudinally extending edge portions;

embossing means communicating with said supply of metal strip for continuously forming longitudinally extending corrugations on both sides of said metal strip while leaving the opposed longitudinally extending edge portions in said strip uncorrugated, said uncorrugated edge portions

extending longitudinally along the axis of the strip and being coextensive with and extending inwardly from each of the longitudinal free edges of the strip said embossing means leaving the uncorrugated edge portions on the same plane as the corrugated portions at the peak of a corrugation and each uncorrugated edge portion on the same plane as the other;

tube forming means communicating with said corrugating means for continuously forming said strip into the shape of a tube with the longitudinally extending strip edges abutting and extending in a straight line along the axis of the formed tube, said tube forming means substantially continuously contacting both the uncorrugated edge portions and the corresponding peaks of the corrugations to form the substantially flat strip into a tube with the uncorrugated edge portions and the corresponding peaks of the corrugations being on the outer diameter of the tube; and

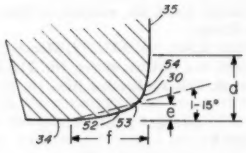
welding means communicating with said abutting longitudinally extending strip edges and continuously joining them together to form a fluid and pressure tight tube having longitudinally extending corrugations and a weld seam extending in a straight line longitudinally along the axis of the tube and uncorrugated portions of the tube surface coextensive with the weld seam on both sides thereof extending circumferentially outwardly therefrom and in a straight line along the axis of the tube corresponding to the uncorrugated portions of said strip.

3,921,884

BEAM LEAD TOOL

Thomas L. McDonough, Nahant, and Martin M. McDonough, Swampscott, both of Mass., assignors to Calx, Inc., Lynn, Mass.

Filed Sept. 28, 1973, Ser. No. 401,870
Int. Cl.² B23K *19/04*
U.S. Cl. 228—44.1 **13 Claims**



1. A tool for positioning and bonding a beam lead semiconductor wafer comprising;

an upper portion adapted to be connected to a holder, and a lower portion terminating in a tip,

said lower portion having means defining a peripheral wall having a lower contacting surface and forming a recess in the tip for accommodating the semiconductor wafer,

said wall defining an arcuate inner edge,

said peripheral wall beind defined at least in part by an inner wall surface defining the recess,

said inner edge approximating a curvature of greater than 0.3 mils and formed to assymptotically approach said inner wall surface and said lower contacting surface,

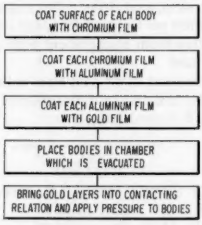
wherein the form of the inner edge is controlled by the equation $c = (f)$ PK where p = applied pressure, c = curvature of arcuate inner edge and K = thickness of nap of chamois.

3,921,885

METHOD OF BONDING TWO BODIES TOGETHER

Joseph Dale Knox, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,396
Int. Cl.² B23K *21/00*
U.S. Cl. 228—116 **3 Claims**


COAT SURFACE OF EACH BODY WITH CHROMIUM FILM
COAT EACH CHROMIUM FILM WITH ALUMINUM FILM
COAT EACH ALUMINUM FILM WITH GOLD FILM
PLACE BODIES IN CHAMBER WHICH IS EVACUATED
BRING GOLD LAYERS INTO CONTACTING RELATION AND APPLY PRESSURE TO BODIES

1. A method of bonding together two bodies of an acoustic material comprising the steps of

applying a layer of gold on a surface of each of the bodies, placing the bodies in a chamber,

evacuating said chamber to a pressure of at least 10^{-3} torr, bringing the gold layers into contacting relation, and

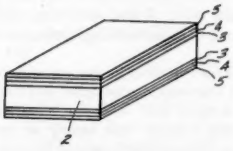
with the bodies being at room temperature applying a pressure of 800 to 1600 psi to said bodies for a time sufficient to bond the gold layers together.

3,921,886

METHOD FOR PRODUCING A CATALYST

James A. Ford, North Haven, Conn., and Sheldon H. Butt, Godfrey, Ill., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 385,077, Aug. 2, 1973, Pat. No. 3,876,456, which is a continuation-in-part of Ser. No. 342,271, March 16, 1973, Pat. No. 3,810,754. This application Dec. 12, 1974, Ser. No. 532,074
Int. Cl.² C22C *11/04*; C23B *17/00*
U.S. Cl. 228—117 **8 Claims**



1. A method for producing a catalyst comprising the steps of:

A. providing a nickel alloy substrate having at least one clean major surface, said alloy containing from 2 to 6% aluminum, from 0.5 to 4% silicon and the balance essentially nickel;

B. providing a layer of a surface alloy material of copper or a copper alloy having at least one clean major surface, said layer having a thickness of from 1000 A to 0.1 inch;

C. applying said layer to the surface of the substrate by arranging the substrate and said layer so that the clean major surfaces thereof come into contact and pressure bonding the substrate and the layer by rolling; and

D. heat treating the substrate-surface layer combination of from 750° to 1050°C for from 5 minutes to 4 hours in an atmosphere nonoxidizing to nickel, whereby the surface layer and the substrate interdiffuse so that the ratio of

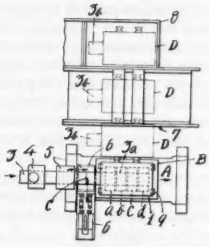
nickel to copper at the surface of the catalyst is from 50-50 to 90-10%.

3,921,887

PROCESS FOR CONTINUOUSLY PROCESSING A WEB OR STRIP MATERIAL IN A PRESS

Toshinori Maehara, Tokyo; Yoshinobu Kimura; Hirotoku Takeuchi, both of Chiryu, and Masao Takegami, Chita-Gun, all of Japan, assignors to Aida Engineering Kabushiki Kaisha and Zaidan Hojin Kikai Shinko Kyokai, Tokyo, both of, Japan

Filed Aug. 9, 1974, Ser. No. 496,217
Claims priority, application Japan, Aug. 18, 1973, 48-92087
Int. Cl. B21j *13/08*
U.S. Cl. 228—155 **2 Claims**



1. A process for continuously processing a web or strip material in a press in which an upper and lower die unit assembly with each unit having a series of aligned dies arranged in a line is employed for successively processing the material while the material is being fed in increment through successive pressing steps from one side of the press toward the other side of the press where the pressed product is discharged, characterized by that after the product which had been processed in the final pressing step has been discharged from said other side of the press leaving a semimanufactured portion of the material held between the upper and lower die units of the die assembly, the semimanufactured material portion is sheared off the remaining portion of the material in a position at a distance from the feed side of the die unit assembly with a section of the material connected to the semimanufactured material portion projecting from the die unit assembly, the die unit assembly having the sheared semimanufactured portion held therein is removed from the body of said press and carried to a die storage by a die exchanger to be stowed therein, thereafter, when the die unit assembly is to be reused, the die unit assembly is taken out of the storage and carried to the press body by said die exchanger to be reset therein, the leading end of a succeeding material being fed through said press is butt-jointed to the adjacent end of said projecting material portion connected to the semimanufactured material portion held in said reset die unit assembly by welding or brazing and thereafter, the press is operated for a continuous pressing operation.

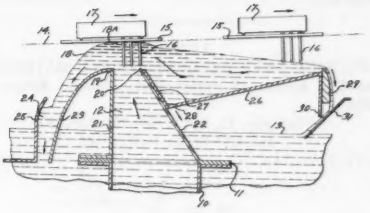
3,921,888

WAVE SOLDERING OF PRINTED CIRCUITS

Donald Allan Elliott, Brossard, and Zoltan Palko, St. Lambert, both of Canada, assignors to Electrovert Inc., Canada

Filed Dec. 16, 1974, Ser. No. 533,199
Claims priority, application Canada, Oct. 7, 1974, 210934
Int. Cl.² H05K *3/34*
U.S. Cl. 228—180 **18 Claims**

1. A method of applying solder to one face of a circuit board or the like having protruding pins extending therefrom, comprising the steps of passing a circuit board at a predetermined speed along a path having an upward slope and with the protruding pins extending downwardly; forming an upwardly flowing solder wave beneath such path so that the face of the circuit board, having pins protruding therefrom, enters an entry side of the solder wave and exits on an exit side of the solder wave; directing a major volumetric portion of the solder wave to flow downwardly on the entry side of the wave; guiding the remaining volumetric portion of the solder wave to



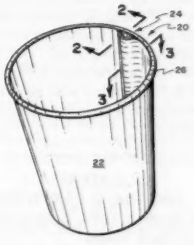
flow from the exit side of the wave as a smooth stream of solder in substantially the same direction and at substantially the same speed as that of the circuit board moving along such path; and withdrawing the circuit board from such smooth stream of solder with a relative movement, between the protruding pins of the circuit board and the smooth stream of solder, which is substantially only vertical.

3,921,889

DISPOSABLE CUP WITH INTEGRAL SEAM STRAW

Delamar J. Gibbons, P.O. Box 404, Blanding, Utah 84511

Filed Sept. 12, 1974, Ser. No. 505,397
Int. Cl.² A47G *19/22;* **B65D** *5/02*
U.S. Cl. 229—7 S **4 Claims**



1. A disposable drinking cup, which may be nested with one or more cups of the same construction, comprising:

a generally vertically directed thin wall of impervious sheet material having opposed overlapping end wall areas defining a lap joint extending along essentially the entire height of the wall;

upper edge means disposed at the top of the wall, the upper edge means defining a top opening to the cup of a first diameter;

a thin bottom wall of impervious sheet material filling the space between and being integral with the generally vertical wall at the bottom edge thereof, the diameter of said space being less than said first diameter;

the opposed overlapping end wall areas of said lap joint being overlapped one in respect to the other with the extreme end of each being flatly secured to the opposite wall area, each wall area having essentially the same height as the other and at least one having a substantially greater circumferential dimension than the straight line distance between the flatly secured ends, the at least one wall area having the greater circumferential dimension extending radially away from said straight line distance to from an unencumbered hollow passageway between the

unattached wall areas adjacent the flatly secured ends thereof, said passageway comprising an open unobstructed liquid effluent port adjacent the upper edge of the cup;

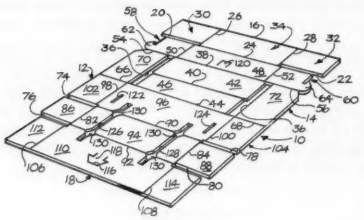
the wall area comprising the passageway which is exposed to the interior of the cup comprising an open unobstructed liquid inffluent port adjacent the bottom wall of the cup.

3,921,890

PACKING DEVICE FOR FRANGIBLE MATERIAL

Richard S. Reihm, 19 Poplar Park, Pleasant Ridge, Mich. 48069

Filed Jan. 22, 1973, Ser. No. 325,937
Int. Cl.² B65D *5/40, 85/48*
U.S. Cl. 229—14 C **18 Claims**



1. A one-piece packing device for use in packing frangible sheet-like materials, comprising,

a pair of spaced apart side wall sections,

a top section extending between said side wall sections and defining at least one recessed area adapted to receive an edge portion of a frangible plate or the like,

an intermediate section disposed interiorly of said top section and extending between said side sections,

said intermediate section being spaced from said top section and located directly below said recessed area, and

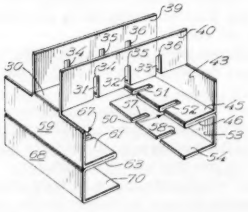
a truss section extending generally diagonally between said side wall sections.

3,921,891

ONE PIECE PARTITION

Jack C. Gorham, Keokuk, Iowa, assignor to Hoerner-Waldorf Corporation, St. Paul, Minn.

Filed Feb. 24, 1975, Ser. No. 552,415
Int. Cl.² B65D *5/48, 85/00*
U.S. Cl. 229—15 **5 Claims**



1. A blank made from foldable paperboard or similar sheet-like material and adapted to be erected into a one-piece multicell container partition, said blank comprising:

a substantially rectangular sheet of said material;

said sheet having a top edge, a bottom edge, and opposed lateral sides;

a center section adapted to be folded to form the base of said partition in final erected form;

at least two center section support panels, said center section support panels separated by a first slot extending perpendicular to said top edge;

a first center rib panel hingedly connected along a fold line to the top edge of said center support panels and foldable normally to said center support panels into position to become the first center rib of said partition said first rib panel having formed therein a slot partially therethrough coaxial with and extending from said first slot separating said center support panels;

a first lateral panel located at the side of a first of said center section support panels opposite said first slot and hingedly connected thereto along a fold line perpendicular to the top edge of said blank;

a second lateral panel hingedly connected to said first lateral panel along a fold line parallel to said first fold line and having a first slot formed therein partially therethrough opening to the outside edge thereof and oriented on a line extending from said fold line connecting said center support panels and said first rib panel;

a third lateral panel hingedly connected along a third hinge line to a second of said center support panels and opposite said first slot, said third hinge line being parallel to said first hinge line; and

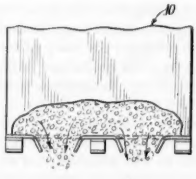
a fourth lateral panel hingedly connected to said third panel along a fourth hinge line parallel to said third hinge line, said fourth panel having a first slot formed partially therethrough opening the outside edge thereof and oriented along a line colinear with said first slot in said second panel.

3,921,892

BOTTOM DUMP CONTAINER FOR BULK MATERIAL

Henry J. Macie, 5350 S. 8th Ave., LaGrange, Ill. 60525

Filed May 28, 1974, Ser. No. 473,447
Int. Cl.² B65D *5/72, 17/00*
U.S. Cl. 229—17 B **14 Claims**



1. A corrugated box bottom dump container comprising:

a pallet support;

an outer wall section attached to said pallet support;

a removable middle liner coextensive with and disposed within said outer wall section;

a removable inner liner coextensive with and disposed within said middle liner;

a container bottom comprising a separate disposable and replaceable bottom dump panel extending over substantially the entire bottom area of the container; and

panel tearing means in said replaceable bottom dump panel for creating opening means therein to release contents from said container.

3,921,893

CONTAINER

Edward L. Randle, Jr., Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 24, 1974, Ser. No. 482,090
Int. Cl.² B65D 5/32, 13/00
U.S. Cl. 229—23 R 2 Claims

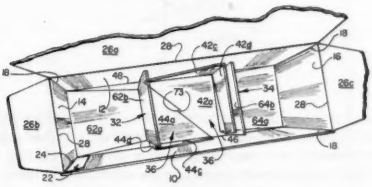
1. A compartmented Bliss-style container comprising, in combination: a wrapper formed from foldable sheet material and including a bottom wall, a first pair of sidewalls connected to opposite edges of the bottom wall and positioned perpendicularly to the bottom wall, a pair of top closure flaps foldably attached to the upper free edges of said first pair of sidewalls, and attachment tabs foldably connected to the opposite free edges of the bottom wall, the first pair of sidewalls and the top closure flaps, and an insert formed from foldable sheet material and positioned within said wrapper, said insert including a pair of partition panels foldably attached to each other and folded so as to be in face-to-face engagement to form a partition member, and wall-forming panels hingedly attached to the opposite ends of each of said partition panels and positioned perpendicularly to said partition panels to form a second pair of sidewalls for said container, said attachment tabs on said bottom wall, said first pair of sidewalls, and said top closure flaps being folded into engagement with said second pair of sidewalls, and one of said pair of top closure flaps being substantially larger than the other of said top closure flaps so as to overlie at least a portion of each wall-forming panel of said second pair of sidewalls.

3,921,894

LOCK BOTTOM COMPARTMENTED BOX

Robert A. Hackenberg, East Lyme, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

Filed Nov. 1, 1974, Ser. No. 519,847
Int. Cl.² B65D 5/48
U.S. Cl. 229—27 7 Claims



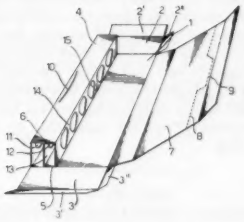
1. A compartmented box comprising a first pair of identical wall panels, a second pair of identical wall panels hinged alternately to those in the first pair to form a tube, a first pair of substantially identical zig-zag shaped flaps hinged to the corresponding free edges of the panels in the first pair, a second pair of identical generally rectangular flaps hinged to the corresponding free edges of the panels in the second pair, and means for connecting the free end of each zig-zag-shaped flap to the free end of the adjacent rectangular flap so that when the wall panels are opened up to form a tube, the flaps fold downwards and outwards away from the wall panels with the zig-zag-shaped flaps underlying the rectangular flaps and interlocking with one another to form a sturdy bottom closure for the box and with the connected-together portions of the flap pairs forming transverse dividing walls within the box, and wherein each flap in the first pair has a laterally extending flap section hinged to its free end and means for connecting together overlapping portions of said laterally extending flap sections so that two together form an additional transverse dividing wall within the box.

3,921,895

BOX FOR CONTAINING VIALS OR THE LIKE ADAPTED FOR AUTOMATIC LOADING

Arrigo Ziche, Vicenza, Italy, assignor to Brevetti C.E.A. S.p.A., Italy

Filed May 22, 1974, Ser. No. 472,445
Int. Cl.² B65D 5/36, 5/58
U.S. Cl. 229—39 B 3 Claims



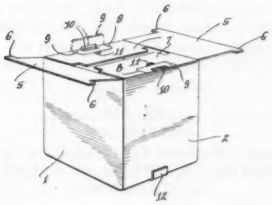
1. A cardboard box adapted for automatic loading of vials, comprising a bottom flap, two side flaps each connected at two opposite sides of the bottom flap, two first projections connected to two sides of the side flaps, two second projections connected to the other two sides of the side flaps, a base flap folded several times and glued, a front flap connected to said bottom flap along a third side between the two sides which are provided with the side flaps and opposite the side which supports said base flap, said base flap when raised forming a prismatic element of substantially square cross section, with an intermediate wall, said prismatic element having polygonal holes with rounded corners on the face facing the interior of the box, having circular holes both on the face facing the outside and on said intermediate wall, said circular holes on the face facing the outside coinciding with the circular holes on the intermediate wall, the vials being inserted through said circular holes and being held by the holes of polygonal shape when the box is assembled, said side flaps being disposed vertically, said first projections being folded to lay horizontally and being glued to said base flap, said second side projections being folded and glued to the bottom flap to seal the box, said front flap being folded twice to complete the front wall after the box is filled.

3,921,896

RESEALABLE CONTAINER

Mamoru Ishimura, Yokohama, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1974, Ser. No. 534,111
Claims priority, application Japan, Dec. 22, 1973, 48-146287
Int. Cl.² B65D 5/66, 5/10
U.S. Cl. 229—39 R 1 Claim



1. An article of manufacture for forming a resealable container, comprising, (a) two rectangular side panels; (b) rectangular front and rear panels; said front, rear and side panels

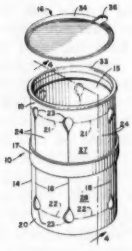
being joined together to form a pillar having square top and bottom openings; (c) bottom end panels foldably affixed to the bottom edges of said side, front and rear panels, adapted to fold inwardly of said pillar so as to close the bottom opening of said pillar; (d) a first set of top panels foldably affixed to the top edges of said front and rear panels, adapted to fold inwardly of said pillar so as to block the top opening of said pillar, said top panels having perforated locking flaps containing a slit running along the top edges of said front and rear panels; (e) a second set of top panels foldably affixed to the top edges of said side panels, adapted to fold inwardly of said pillar in superimposed relationship to said first set of top panels, and having flaps projecting from the corners remote from said top edges of said side panels; wherein said second set of top panels are adapted such that when they are in superimposed inwardly folded relationship to said first set of top panels, said projecting flaps are receivable by said slits in locking relationship.

3,921,897

COLLAPSIBLE CONTAINER AND PACKAGE

Androus D. Noyes, 12 Somerstown Road, and Robert N. Marona, 66 Somerstown Road, both of Ossining, N.Y. 10562

Filed Oct. 16, 1974, Ser. No. 515,405
Int. Cl.² B65D *5/36, 5/60*
U.S. Cl. 229—41 R **21 Claims**



1. A collapsible container comprising a tubular body member having top and bottom ends, a bottom wall closing said bottom end, a plurality of equally spaced longitudinal slits provided in said tubular body and dividing said tubular body member into a plurality of peripherally separated longitudinal panels, said slits terminating short of the ends of said tubular body member leaving peripherally continuous top and bottom end portions at the opposite ends of said body member, upper and lower transverse hinge means provided at the top and bottom of said panels for hingedly connecting said panels to said top and bottom end portions respectively intermediate hinge means provided intermediate said upper and lower transverse hinge means permitting said panels to collapse outwardly, a peripheral band encompassing said tubular body member and slidable longitudinally thereon, said band being slidable over said intermediate hinge means to prevent the outward collapse of said panels, and slidable from over said intermediate hinge means to a position over one of said end portions to permit collapse of said panels outwardly.

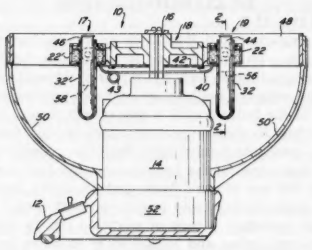
3,921,898

CENTRIFUGE

Kenneth Finkel, 919 Clinton St., Philadelphia, Pa. 19107

Filed May 29, 1974, Ser. No. 474,468
Int. Cl.² B04B *9/14*
U.S. Cl. 233—23 A **8 Claims**

1. A centrifuge comprising a motor mounted on a support structure, a rotor connected to the motor for rotation about a first axis, two annular supports on said rotor for rotation therewith about said axis, said annular supports being on opposite sides of said first axis and mounted for rotation about a second axis which is perpendicular to said first axis, each annular support having a chamber for containing a liquid, conduit means providing communication between said chambers, each annular support being adapted to receive a test tube, and means associated with each support for applying pressure to liquid in the chamber associated with its support in response to centrifugal force on a test tube.

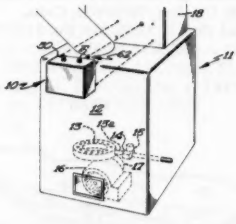


3,921,899

ELECTRONIC FURNACE CONTROL SYSTEM

Clair Hamilton, 2149 105th Lane NW,, Coon Rapids, Minn. 55433

Filed July 19, 1974, Ser. No. 490,015
Int. Cl.² F24D *5/04;* **F24F** *11/00*
U.S. Cl. 236—9 A **4 Claims**



1. An electronic furnace control system for forced air gas or oil fired furnaces including a plenum chamber, a burner mechanism connected to a source of fuel, a valve controlling the flow of fuel to the burner mechanism, a solenoid operating the valve, a motor driven fan for circulating air, a furnace operating circuit connected with the fan motor and solenoid, a thermostat for controlling operating of the furnace operating circuit, said electronic furnace control system comprising:

a normally open fan relay circuit connected with the furnace operating circuit,

a relay latching circuit connected with the fan relay circuit, a delayed electronic pulse-emitting timing circuit including a pulse emitter which emits a single delayed pulse signal after the timing circuit has been energized,

a relay switching circuit connected with the furnace operating circuit and pulse-emitting timing circuit and being operable to energize the later when the solenoid is energized by the thermostat,

a gated control circuit connected with the fan relay circuit and relay latching circuit and being operable to receive the pulse signal from the pulse emitter and to energize the fan relay circuit and relay latching circuit, said relay latching circuit being operable to latch the fan relay circuit in closed condition while the furnace operating circuit has been closed by the thermostat,

an electronic temperature sensing circuit being operable to sense the temperature in the plenum chamber and provid-

ing a changing voltage signal in response to changes in temperature in the plenum chamber, the voltage signal provided by the electronic temperature sensing circuit decreasing in magnitude as the temperature in the plenum chamber increases and increasing in magnitude as the temperature in the plenum chamber decreases,

a comparator and amplifying circuit receiving the output voltage from the sensing circuit and amplifying said voltage when it exceeds a predetermined magnitude, said comparator and amplifier circuit including adjustable circuit means for sensing temperature changes in an increasing order of magnitude and including an adjustable electronic hysteresis circuit means for sensing temperature changes in the decreasing order of magnitude, whereby the electronic furnace control may be adjusted to control operation of the furnace within an optimum temperature range,

a normally closed solenoid relay circuit connected with a solenoid and with the comparator and amplifying circuit said solenoid circuit receiving the recurrent amplified output voltage from the comparator and amplifying circuit and being operable to de-energize the solenoid, said solenoid relay circuit being closed to energize the solenoid when the temperature in the plenum chamber falls below a predetermined level, and while the furnace operating circuit is closed by the thermostat,

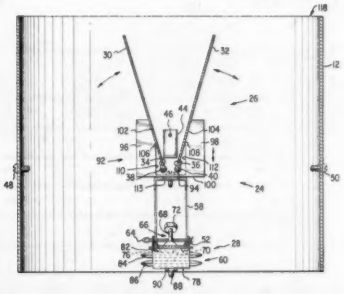
a delayed pulse-emitting reset timing circuit connected with the relay switching circuit, the fan relay circuit and relay latching circuit, and being operable to emit a delayed pulse signal to de-energize and reset the fan relay circuit and relay latching circuit when the furnace thermostat has opened the furnace operating circuit.

3,921,900

AUTOMATIC, TEMPERATURE RESPONSIVE DAMPER ASSEMBLY

James D. Cole, 6403 Shoal Creek West, Austin, Tex. 78731

Filed June 24, 1974, Ser. No. 482,699
Int. Cl.² G05D *23/02*
U.S. Cl. 236—93 **6 Claims**



1. An automatic temperature responsive damper assembly for use within a ventilating conduit, said assembly comprising:

at least two movable vanes carried within said conduit, each of said vanes being movable between a generally horizontal closed position and a generally vertical open position in response to temperature changes in said ventilating conduit;

a temperature responsive drive assembly mounted on a bracket within said conduit beneath said vanes, said drive assembly being movable in response to temperature changes in said ventilating conduit;

a lever positioned in said conduit and located between said drive assembly and said vanes, said lever being pivotably connected at a first end to said bracket, and being provided at a second end with at least one vane engagable finger;

means to communicate said movement of said drive assembly to said lever; and,

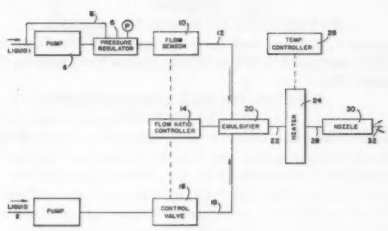
a camming surface for each of said movable vanes on said vane engagable finger, each of said camming surfaces slidably contacting a corresponding one of said vanes to move said vanes between said open and closed positions in response to said movement of said drive assembly.

3,921,901

ATOMIZATION OF LIQUID FUELS

David Edward Woodman, Wayland, Mass., assignor to Resource Planning Associates, Inc., Cambridge, Mass.

Filed May 28, 1974, Ser. No. 473,826
Int. Cl.² B05B *17/06*
U.S. Cl. 239—13 **9 Claims**



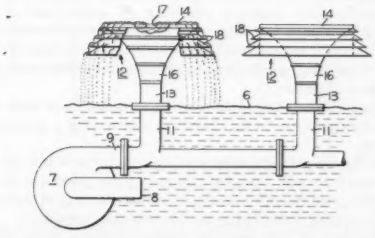
1. The liquid fuel atomizing method for producing fine fuel particles in furnace buner sprays comprising the steps of mixing a relatively small quantity of first liquid and a relatively large quantity of second liquid fuel, forming a plurality of first liquid droplets in a second liquid matrix, heating the liquids under pressure to a range of temperatures above a temperature at which the first liquid boils and vaporizes upon being rapidly released to the lower pressure, flowing heat from the second liquid fuel to the first liquid to continue vaporization while releasing the fluids to a lower pressure, thereby flashing the first fluid and thereby shattering and forming minute particles of the second fluid.

3,921,902

COLLAPSIBLE COOLING TOWER

Reinhold Barry Erickson, and Bruce R. Lipe, both of Cincinnati, Ohio, assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 30, 1974, Ser. No. 510,735
Int. Cl.² B05B *17/08, 15/10*
U.S. Cl. 239—17 **4 Claims**



1. A system for cooling a body of liquid, comprising in combination:

a liquid discharge member including an inlet end and an outlet end wall, selectively extendable and collapsible

side walls joining said ends constructed and arranged such that the weight of said side walls and said outlet end wall will cause said member to collapse;

means supporting said liquid discharge member above said body of liquid;

liquid pressurizing means;

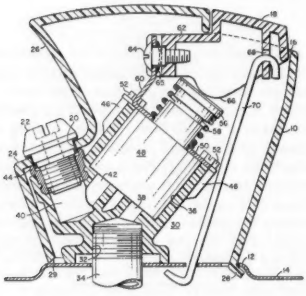
means connecting said liquid pressurizing means to said inlet end of said liquid discharge member; and

walls defining a liquid discharge opening through said outlet end wall, said discharge opening being of a predetermined size such that said liquid cooling member will extend substantially vertically above said body of liquid under the influence of the pressurized liquid supplied thereto and the liquid will flow from said discharge opening and fall back to said body of liquid and in the process be cooled.

3,921,903
WATER COOLER BUBBLER ASSEMBLY

Stephen L. Grimes, and Jerry M. Rainey, both of Columbus, Ohio, assignors to White-Westinghouse Corporation, Cleveland, Ohio

Filed Feb. 20, 1975, Ser. No. 551,561
Int. Cl.² E03B *9/20*
U.S. Cl. 239—24 **3 Claims**



1. A water bubbler assembly, comprising:

a one-piece, hollow, plastic outer shell including a dispensing nozzle opening, and an opening for receiving a pushbotton therein;

a plastic inner core including an internally-threaded, downwardly open bore for receiving the outlet end of the supply pipe, a cartridge valve chamber in communication with said bore and receiving a cartridge valve therein, and a dispensing nozzle chamber in communication with said valve chamber;

a one-piece retainer plate secured to said core to hold said cartridge valve in its chambers and having a projecting lug;

operator means carried by said lug and movable toward and away from said valve for controlling the operation of said valve, said operator means including an integral pushbutton portion received in said pushbutton openings;

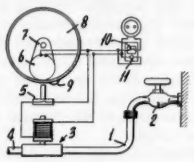
means biasing said operator means toward a valve closed position and in a direction to urge said pushbutton portion toward said pushbutton opening; and

a dispensing nozzle projecting through said nozzle opening and into said nozzle chamber to secure said core to said shell.

3,921,904
AUTOMATIC APPARATUS FOR IRRIGATION, WITH TIMER

Fernando Roveda, Corso Vercelli, 35, Milan, Italy (20144)

Filed Mar. 5, 1974, Ser. No. 448,182
Claims priority, application Italy, Mar. 6, 1973, 21216/73
Int. Cl.² B05B *12/02*
U.S. Cl. 239—70 **13 Claims**

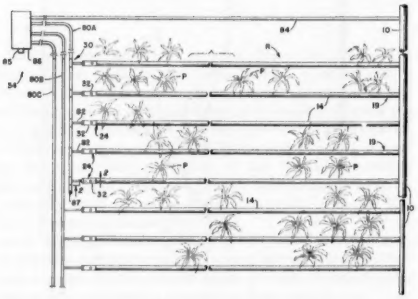


1. Apparatus for automatically irrigating or watering plants and the like on a timetable and for a predetermined period comprising, in combination, an electro-valve for opening and closing a conduit for the distribution of water, a switch for controlling said electro-valve, a rotating timer disc having a peripheral edge portion, at least one cam-supporting clamping element arranged to be detachably mounted on said timer disc peripheral edge portion at a selected location on the circumference of said disc in accordance with the desired timetable, a cam arranged to be mounted on said clamping element for operating said switch, said cam having an extension of a selected size in accordance with the desired length of the period of irrigation.

3,921,905
SOIL IRRIGATION METHODS AND APPARATUS

Bruce A. McElhoe, Waialua, and Joseph G. Tabrah, Kahuku, both of Hawaii, assignors to Hawaiian Sugar Planters' Association, Honolulu, Hawaii

Filed Nov. 11, 1974, Ser. No. 522,912
Int. Cl.² B05B *15/02*; **F23D** *13/28, 11/34*; **B05B** *15/00*
U.S. Cl. 239—110 **6 Claims**



1. A soil irrigating system comprising:

a plurality of drip tubes communicating with a supply of pressurized liquid;

said drip tubes each including drip orifices arranged to dispense a substantially continuous flow of said liquid to the soil;

a plurality of flushing valves connected to remote ends of said drip tubes, each flushing valve comprising:

primary inlet means communicating with an associated drip tube,

liquid outlet means for discharging liquid from said primary inlet means,

pilot opening means arranged to introduce pressurized liquid to said valve, and

valve element means shiftable to an open position in response to the urgings of pressurized liquid from said primary inlet means to communicate said primary inlet means with said outlet means, and shiftable to a sealing position in response to the urgings of pressurized liquid from said pilot opening means to block communication between said primary inlet means and said outlet means; and

pilot control means operably connected between said supply of pressurized liquid and said pilot opening means of said flushing valves for:

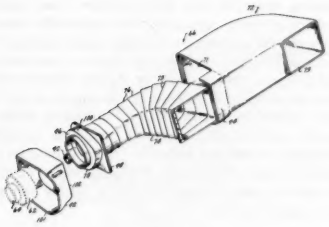
conducting pressurized liquid simultaneously to said pilot opening means to shift said valve element means to said sealing position to prevent flushing of said drip tubes, and

relieving liquid pressure simultaneously at said pilot opening means such that said valve element means are shifted to said open posture in response to urgings of pressurized liquid from said drip tubes, for permitting flushing of said drip tubes to remove solid particles therefrom.

3,921,906
INFRARED SUPPRESSION SYSTEM FOR A GAS TURBINE ENGINE

James Leroy Nye, Marblehead; Samuel Rothrock Barr, Swampscott; Thomas Chew, West Peabody, and William Steyer, Ipswich, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Dec. 2, 1974, Ser. No. 528,797
Int. Cl.² B64D *33/04*
U.S. Cl. 239—127.3 **4 Claims**



1. An infrared suppressor for a gas turbine engine comprising:

an outer casing for receiving the hot engine exhaust stream including an inlet and outlet through which the hot exhaust stream may respectively enter and exit from the outer casing;

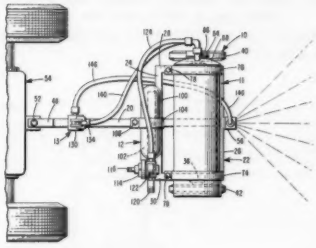
a liner disposed within the casing and spaced inward therefrom to define a cooling plenum therebetween for receiving a cooling airflow and further including a plurality of slots therein through which the cooling airflow mixes with the hot engine exhaust, and

an annular manifold ring upstream of the liner having an inlet for receiving a second cooling airflow from a source other than the source of cooling airflow to the plenum and an annular outlet slot through which the second cooling airflow is ejected into the hot engine exhaust stream.

3,921,907
SPRAY DEVICE

Jack William Anderson, Rt. 1, East Berlin, Pa. 17316

Filed Nov. 29, 1974, Ser. No. 528,551
Int. Cl.² B05B *9/04*
U.S. Cl. 239—172 **8 Claims**



1. A chemical spraying apparatus comprising:

a carriage having a pair of laterally spaced wheels,

a pressurizable chemical tank mounted transversely on said carriage, said chemical tank having first and second ends, said first end terminating in a substantially flat surface and said second end being provided with a chemical tank filler opening, said first end being so positioned on said carriage that a plane through said flat surface is substantially parallel to a plane through one of said wheels and is spaced laterally outwardly with respect thereto,

a gas storage bottle for holding pressurized gas mounted on said carriage and being in communication with said chemical tank,

first valve means for controling the flow of pressurized gas from said gas bottle to said chemical tank,

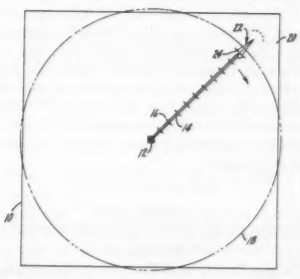
chemical spray nozzle means, and

second valve means for controling the flow of chemical from said chemical tank to said nozzle means.

3,921,908
CORNER IRRIGATION MACHINE

Arthur L. Zimmerer, Lindsay, Nebr., assignor to Lindsay Manufacturing Company, Lindsay, Nebr.

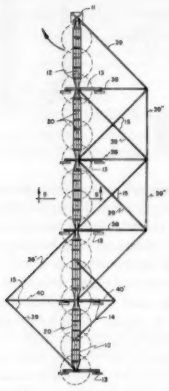
Filed Aug. 16, 1974, Ser. No. 497,866
Int. Cl.² B05B *3/12*
U.S. Cl. 239—177 **8 Claims**



1. In a center pivot irrigation system, a string of pipe extending outwardly from a center pivot and supported at intervals by movable towers, an overhung boom on and supported by the outermost tower and constructed to freely project a substantial distance beyond the outermost tower and to be withdrawn from its projected position, and power means for operating the boom so that it is freely overhung and extending

substantially beyond the outermost tower in certain areas and is withdrawn to a position generally coincident with the outermost tower in other areas as the center pivot irrigation system moves around a field.

3,921,909
IRRIGATION SYSTEM
Arthur J. Hieb, 501 18th St., Rupert, Idaho 83350
Filed Jan. 9, 1975, Ser. No. 539,892
Int. Cl.² B05B *3/00*; A01G *25/02*; B05B *15/06*
U.S. Cl. 239—177 **6 Claims**



1. An orbital irrigation system employing a rotatable pivot head as a supply take-off, comprising:

a sprinkler conduit issuing horizontally from said pivot head, said sprinkler conduit including a multiplicity of distally disposed sprinkler heads, said sprinkler conduit being carried by wheel sets disposed at intervals along the length of said sprinkler conduit, each wheel set comprising an A-frame mounted at its apex transversely to said conduit and wheels journally mounted at the lowermost terminal ends of said A-frame, horizontal and lateral stressing including a multiplicity of masts issuing transversely at intervals from said sprinkler conduit, and cable fastened to said conduit at a point distally from said pivot over terminal ends of said masts to alternate bases of said masts at said conduit; and

a drive carriage assembly including a frame mounted distally from the terminal end of said sprinkler conduit opposite said pivot, wheels disposed transversely to said supply conduit mounted to said frame, and a motor and transmission mounted on said frame and mechanically connected to said wheels, at least one of said wheels being provided with a gear box driven by combination means and means for providing mechanical rotation to said gear box and for dispensing a spray of water supplied from said sprinkler conduit.

3,921,910
POP-UP SPRINKLER WITH MULTIPLE-PURPOSE ONE-PIECE SEAL
Jerry R. Hayes, Peoria, and Kenneth J. Bruninga, Mapleton, both of Ill., assignors to L. R. Nelson Corporation, Peoria, Ill.
Filed Feb. 4, 1975, Ser. No. 546,987
Int. Cl.² B05B *15/10*
U.S. Cl. 239—205 **4 Claims**

1. A pop-up sprinkler comprising:

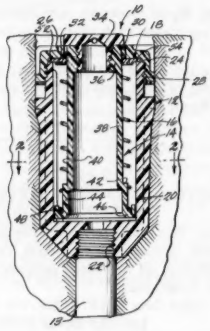
a housing assembly including separable parts adapted to be stationarily mounted in the ground and to be communicated with a source of water under pressure,

a sprinkler head assembly carried by said housing assembly for movement from a retracted storage position therein into an extended operative position in response to the communication of said water source with said housing assembly,

coil spring means between said housing assembly and said sprinkler head assembly for resiliently urging said sprinkler head assembly into said retracted storage position in response to the closing of communication of said water source with said housing assembly, and

a multiple-purpose one-piece annular seal cooperatively engaging said housing assembly, said sprinkler head assembly and said coil spring means,

said annular seal having means for performing the following specified functions: (1) provide a static seal between said



separable parts of said housing assembly (2) provide a spring seat for one end of said coil spring means, (3) provide a pressure responsive leakage path between said housing assembly and said sprinkler head assembly for passage of water upwardly and outwardly therethrough when the water source is initially communicated with said housing assembly to thereby remove contiguous debris and prevent the passage of debris downwardly therethrough during the extending movement of said sprinkler head assembly, (4) provide an operative static seal between said housing assembly and said sprinkler head assembly when the latter is in its operative extended position, and (5) provide a wiping and centering action on said sprinkler head assembly during the retracting movement thereof.

3,921,911
PROJECTABLE LAWN SPRINKLER
Kerney T. Sheets, P.O. Box 637, Duplessis, La. 70728
Filed Mar. 6, 1975, Ser. No. 555,956
Int. Cl.² B05B *3/06*
U.S. Cl. 239—206 **13 Claims**

1. A projectable lawn sprinkler comprising:

A. cylindrical housing means open at the top;

B. projectable cylinder means having a top end and a bottom end located inside said housing,

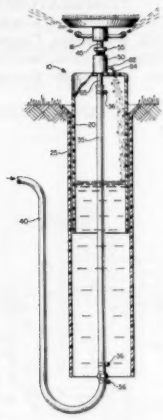
i. said projectable cylinder means having a cylindrical pipe means in the center thereof,

ii. said projectable cylinder means having a hole therein located in the top end of said projectable cylinder means through which water and air may enter the interior of said projectable cylinder means;

C. water supply means connected to said cylindrical pipe means;

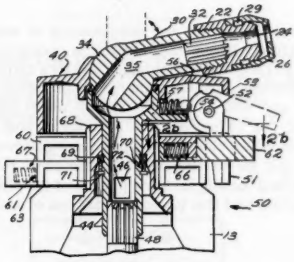
D. means connected to the top of said projectable cylinder means for spraying a stream of water through the atmosphere and onto said hole to force water into said hole;

and



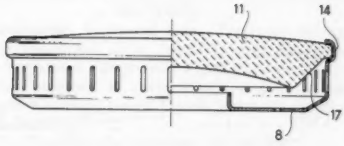
E. nozzle means connected to said cylindrical pipe means for spraying water, said nozzle means being located above said top end of said projectable cylinder.

3,921,912
LAWN SPRINKLER
Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed July 8, 1974, Ser. No. 486,587
Int. Cl.² B05B *3/16*
U.S. Cl. 239—242 **50 Claims**



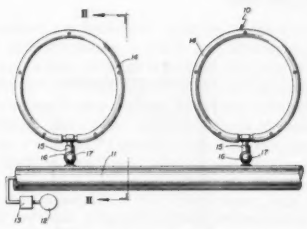
1. A lawn sprinkler having a nozzle assembly comprising
a. a supply of water under pressure,
b. a tubular nozzle having one end adapted to be connected to said supply of water under pressure and a delivery end for delivering water from said supply to an area to be sprinkled,
c. a nozzle face terminating the delivery end of said nozzle, said nozzle face having an eccentric orifice therein, and
d. a nozzle diffuser having a tubular body portion surrounding said nozzle face and mounted on said nozzle for pivotal movement with respect thereto, and a face portion having at least one pointed member forming a border of an orifice therein, said orifice in said nozzle face and said orifice in said nozzle diffuser face portion cooperating to change the diffuseness of the water stream issuing from said nozzle depending upon the relative orientation of said nozzle and said nozzle diffuser.

3,921,913
GAS BURNER HAVING LATERAL OPENINGS AND A DEVICE FOR DEFLECTING THE FLAMES UPWARDS
Marcel Capy, Olivet, France, assignor to Compagnie Europeenne pour l'Equipement Menager, CEPEM, Paris, France
Division of Ser. No. 306,775, Nov. 15, 1972, Pat. No. 3,817,689. This application Apr. 1, 1974, Ser. No. 456,699
Int. Cl.² B05B *1/14*
U.S. Cl. 239—553 **3 Claims**



1. In a thin-walled burner having a mixing chamber defined by a substantially cylindrical, thin, lateral wall with vertical generatrices perforated by vertical slots for the combustion mixture, the improvement comprising a single piece cover means made of ceramic material attached to the upper edge of said lateral wall by a crimped portion, said cover means including a lower face adjacent said slots inclined inwardly of said wall and away from said upper edge which constitutes a fuel deflector.

3,921,914
PLANT FEEDER
Raymond J. Hatt, P.O. Box 503, Amherst, Mass. 01002
Filed Sept. 3, 1974, Ser. No. 502,543
Int. Cl.² B05B *1/18*
U.S. Cl. 239—567 **8 Claims**

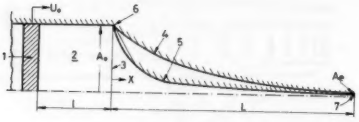


1. A plant feeder system for drip feeding a plurality of plants, comprising:
a. an elongated main conduit adapted to lie alongside the plants,
b. a plurality of tubular annular element having small apertures formed therein, each element being adapted to lie around an individual plant,
c. a connection joining the bight of the main conduit to each element, the connection having a stem formed of a rigid polymeric material and the main conduit being formed of a relatively resilient polymeric material, so that the insertion of the stem of the connector into an aperture in the main conduit causes the material around the aperture to grasp the stem in water-tight relationship.

3,921,915
NOZZLE MEANS PRODUCING A HIGH-SPEED LIQUID JET

Lewis A. Glenn; Bo Lemcke, both of Lausanne, and Inge Ryhming, Mollie-Margot, all of Switzerland, assignors to Institut Cerac SA, Ecublens, Switzerland

Filed July 17, 1973, Ser. No. 380,014
Claims priority, application Sweden, July 19, 1972, 9464/72
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B05B *1/00*
U.S. Cl. 239—589 7 Claims



1. A nozzle means producing a high-speed liquid jet, said nozzle means having an internal cavity to receive a liquid column and leading to a nozzle exit, characterized in that the internal cavity has a continuously converging contour lying within the limits defined by the following two equations:

a) $A/A_o = \left\{1 + (X/L)[(Ae/Ao)^{-1} - 1]\right\}^{-1}$

b) $A/A_o = \left\{1 + (X/L)[(Ae/Ao)^{-1/5} - 1]\right\}^{-5}$

where

A is the variable internal cross-section of the nozzle cavity;

A_o is the value of A at the nozzle entrance;

A_e is the value of A at the nozzle exit;

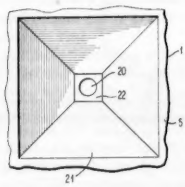
L is the nozzle length from entrance to exit; and

X is the variable coordinate along the axis of the jet nozzle.

3,921,916
NOZZLES FORMED IN MONOCRYSTALLINE SILICON

Ernest Bassous, New York City, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,799
Int. Cl.² B05B *1/08*; G01D *15/18*
U.S. Cl. 239—601 4 Claims



1. A nozzle comprising:

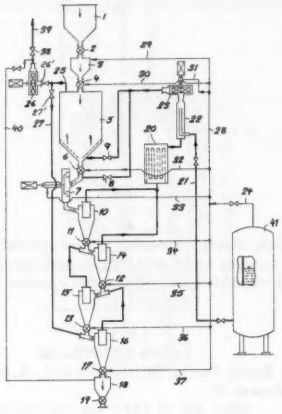
a nozzle body formed of a semiconductor material having a rectangular entrance aperture of a first cross-sectional area which tapers to a second cross-sectional area which is smaller than the cross-sectional area of said entrance aperture; and

a membrane of said semiconductor material formed within said second cross-sectional area and having an exit aperture formed therein having a smaller cross-sectional area than said second cross-sectional area and having a different cross-sectional geometry than said second cross-sectional area.

3,921,917
METHOD OF COMMINUTING OF MATERIALS AT LOW TEMPERATURES

Helmut Meinass, Wolfratshausen, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Mar. 11, 1974, Ser. No. 449,840
Claims priority, application Germany, Mar. 9, 1973, 2311933
Int. Cl.² B02C *23/06*
U.S. Cl. 241—17 5 Claims



1. in a process for the comminution of material at low temperature wherein the material is cooled by a cold gas stream and is entrained through a mill by a carrier gas stream, the improvement which comprises maintaining said cold gas stream and said carrier gas stream under subatmospheric pressure and by passing first portions of both said streams along respective closed paths, discharging a second portion of one of said gas streams into the atmosphere through a compressor, and feeding said first portion of the other of said gas streams into said first portion of said one of said gas streams.

3,921,918
MECHANICAL REFINING OF FIBER MATERIAL INCLUDING STEAM RECYCLE

Viking Per Peterson, Sundsvall, Sweden, assignor to SCA Development Aktiebolag, Sundsvall, Sweden

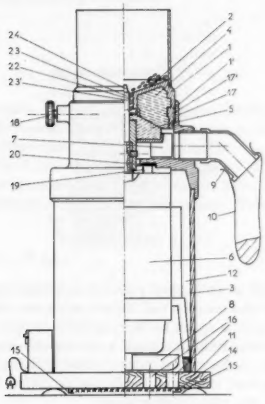
Filed July 17, 1974, Ser. No. 489,138
Claims priority, application Sweden, Sept. 6, 1973, 7312169
Int. Cl.² B02C *7/00*; B27L *11/08*
U.S. Cl. 241—28 6 Claims

1. In a method of treating fiber material involving the steps of first preheating the material with steam under elevated temperature and superatmospheric pressure in a preheater space and then feeding the material as a stream into a disc refiner for refining the material during its outward passage from between the grinding discs of the disc refiner during which passage steam at superatmospheric pressure is developed, the improvement consisting of conducting part of said developed pressurized steam back into the preheater space in order to maintain the temperature and pressure in said preheater space.

3,921,919
MILL FOR PRODUCING MESLINS AND FLOURS

Raymond Zimmer, 14 rue du Chateau, Horbourg (Bas-Rhin), France

Filed Aug. 16, 1973, Ser. No. 388,924
Claims priority, application France, Aug. 31, 1972, 72.31644
Int. Cl.² B02C 9/00
U.S. Cl. 241—56 6 Claims

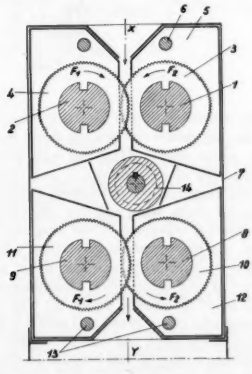


1. A mill for the production of meslins and flours, comprising a fixed annular upper millstone and a rotatable lower millstone, said millstones having a common vertical axis, a casing supporting said upper millstone, an electric motor in said casing, and fan means driven by said motor to draw air through said casing to cool said motor and thence through a chamber below said lower millstone to remove in a stream of air ground meslins and flours that have passed between said millstones.

3,921,920
MACHINE FOR DESTROYING DOCUMENTS

Huguette Brocard, 14, rue de l'Odeon, 75006 Paris, France

Filed Apr. 18, 1974, Ser. No. 461,940
Claims priority, application France, Apr. 27, 1973, 73.15282
Int. Cl.² B02C 13/20
U.S. Cl. 241—159 2 Claims

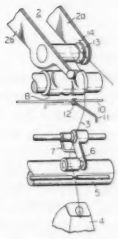


1. Machine for destroying documents comprising, in combination, a first device constituted by two driven shafts to be driven in rotation in opposite directions to one another, cutters being mounted on said shafts, the cutters on one of said shafts interlocking between the cutters on the other of said shafts, a second device similar to and disposed below said first device, and a rotary driven spiral screw disposed between said two devices with the axis of said screw being parallel to those of said shafts of said two devices.

3,921,921
WINDING MECHANISM FOR MAKING YARN PACKAGES OF A CYLINDRICAL FORM IN A TEXTILE MACHINE

Shigeo Katayama; Katsunori Sato; Tomoyuki Miyagawa; Hisateru Takahashi, all of Fukui; Takashi Kato, Kariya; Toshio Yoshizawa, Chiryu, and Yasuo Yamada, Kariya, all of Japan, assignors to Daiwa Boseki Kabushiki Kaisha, Osaka and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of, Japan

Filed Feb. 20, 1974, Ser. No. 443,958
Claims priority, application Japan, Feb. 24, 1973, 48-24096[U]; Aug. 2, 1973, 48-87029
Int. Cl.² B65H 54/10, 65/00
U.S. Cl. 242—18 DD 6 Claims



1. In a winding mechanism of a textile machine provided with a yarn delivery means, a cradle for turnably holding a bobbin wherein a yarn package is formed by a yarn delivered from said yarn delivery means, a driving drum for turning said bobbin and an instant yarn package formed on said bobbin by frictional contact, said cradle comprising a pair of cradle arms connected by a connecting member turnably mounted on a pivot shaft rigidly mounted on a frame of said winding mechanism, the improvement comprising a pair of opposed bobbin holders turnably mounted on said cradle arms, each bobbin holder being provided with a base disc portion and an additional disc portion projecting coaxially from said base disc portion, said additional disc portion having a diameter identical to the diameter of the bore of said bobbin and smaller than the diameter of said base disc portion, one of said bobbin holders being provided with at least one catching member positioned on a peripheral surface of said base disc portion thereof, a cut-out portion formed on said cradle arm at a position adjacent to said bobbin holder provided with said catching member, a cutter disposed on said cradle arm at a position adjacent to said cut-out portion, whereby when a donning operation is carried out, a portion of a yarn being continuously delivered from said delivery means is caught by said catching member, and a yarn connected to a doffed yarn package is cut by said cutter so that a tail end portion of yarn is formed and said tail end portion of yarn is wound on an end portion of said bobbin without being entangled with an innermost layer of yarn formed on said bobbin.

3,921,922
METHOD OF AUTOMATICALLY CHANGING WINDING TUBES AND WINDING APPARATUS FOR IMPLEMENTING THE AFORESAID METHOD AND IMPROVED SPOOL DOFFING MECHANISM

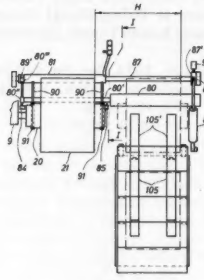
Olivier Wüst, Seuzach, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Division of Ser. No. 350,793, April 13, 1973, Pat. No. 3,856,222, which is a continuation-in-part of Ser. No. 76,181, Sept. 28, 1970, abandoned. This application Mar. 20, 1974, Ser. No. 453,172

Claims priority, application Switzerland, Oct. 3, 1969, 15021/69; Jan. 22, 1973, 854/73; Feb. 2, 1973, 1547/73

Int. Cl.² B65H *67/04*

U.S. Cl. 242—18 A **10 Claims**



1. A method of automatically changing tubes seated upon tube clamping mandrels and wherein each tube, through rotation of a member carrying the tube clamping mandrels, is alternately brought out of a position in contact with a friction drive drum for the purpose of taking-up an endless thread delivered at a high speed and after reaching the desired package size thereon the tube with its package is brought into a package doffing position, the improvement comprising the steps of rocking a gripper in a first direction of movement out of a rest position essentially perpendicular to the axial direction of the tube clamping mandrel carrying the tube with the package wound thereon, engaging the package and its tube by means of the gripper, withdrawing the engaged package and its tube from the tube clamping mandrel by moving the gripper in a direction away from the tube clamping mandrel and essentially in a direction which is parallel with respect to the axial direction of the tube clamping mandrel into a predetermined position, and thereafter releasing the package and its tube by carrying out a rocking movement of the gripper in a second direction of movement opposite to said first direction of movement.

3,921,923
YARN TRANSFER METHOD IN AN AUTOMATIC TAKE-P MOTION

Masanori Kuno, Chiryu, and Tadaaki Kato, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

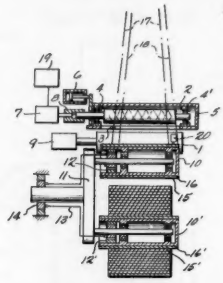
Filed Dec. 6, 1974, Ser. No. 530,487

Claims priority, application Japan, Dec. 24, 1973, 48-2432

Int. Cl.² B65H *67/04*

U.S. Cl. 242—18 A **1 Claim**

1. A method of transferring a yarn from a fully wound take-up bobbin to an unwound bobbin in an automatic take-up motion of a peripheral drive turret type, characterized by the steps of, independently rotating said unwound bobbin, separating said fully wound bobbin from a drive roll peripherally driving said fully wound bobbin, independently rotating said fully wound bobbin, lowering a traverse speed of the yarn to a speed that is most suitable for formation of a transfer tail, displacing a traverse cam roll with a pneumatic cylinder or other known means so as to make the yarn contact with a yarn grasping device provided at an end of the unwound bobbin or on a bobbin holder of the unwound bobin grasping the yarn with said grasping device, cutting off the yarn between said yarn grasping device and said fully wound take-up bobbin by means of a cutter associated with said yarn grasping device to take-up the yarn on said unwound bobbin, restoring the traverse cam roll to its normal position simultaneously with the formation of the transfer tail, accelerating the traverse speed of the yarn up to a speed for normal take-up operation, pressing the unwound bobbin against a driving roll, switching off a power supply to the means independently driving the bobbins, and rotating said unwound bobbin with said driving roll for carrying out the take-up operation.



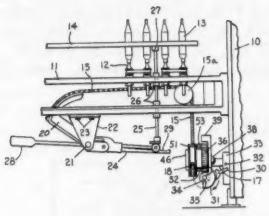
3,921,924
MECHANISM FOR AUTOMATICALLY RESETTING SPINNING FRAME BUILDER MOTION

Bobby R. Ayers; Bobby G. Sanders, and William E. Hanvey, all of Anderson, S.C., assignors to Seabrook, Inc., Anderson, S.C.

Filed Jan. 6, 1975, Ser. No. 538,969

Int. Cl.² B65H *54/36*

U.S. Cl. 242—26.1 **2 Claims**



1. For use in a builder motion for a spinning frame, a twister and the like having means for bearing down the ring rail, and a chain drum progressively advanced with movement in one direction responsive to movement of a drum gear, initiated by traverses of the ring rail, for unwinding a chian and the like connected to the chain drum and the ring rail to control the extent of respective traverses of the ring rail for building a yarn package, the improvement including: a one way clutch coupled between chain drum and said drum gear permitting said movement of said chain drum progressively advanced in one direction prior to bearing down the ring rail; releasable means engaging said chain drum and said drum gear for joint rotation of said chain drum and said drum gear during a building motion; means engaging said releasable means upon completion of a building motion to release said releasable means for engagement with said chain drum and said drum gear whereby said chain drum can rotate with respect to said drum

gear in a chain rewinding direction; resilient means urging said chain drum in an opposite direction rewinding said chain; and means automatically engaging said releasable means upon rewind of the chain to re-engage said releasable means with said chain drum and said drum gear prevent rewinding of the chain during a building motion; whereby upon bearing down the ring rail the force normally exerted on the flexible member is removed resulting in said resilient means moving the chain drum in said opposite direction rewinding said chain preparatory to another building operation.

3,921,925
THREAD FEEDER

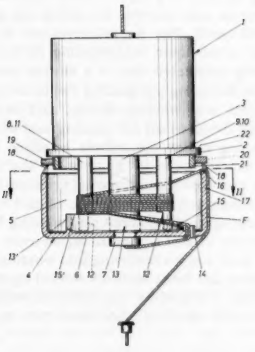
Alberto Gustavo Sarfati, and Giuseppe Vischiani, both of Como, Italy, assignors to Sobrevin Societe de Brevets Industriels Etablissement, Vaduz, Liechtenstein

Continuation of Ser. No. 335,918, Feb. 26, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,504

Claims priority, application Germany, Feb. 26, 1972, 2209215

Int. Cl.² B65H *51/22*

U.S. Cl. 242—47.12 **10 Claims**



1. A thread feeder comprising:

a motor provided with a stationary housing centered on an axis and a shaft having an extremity projecting from said housing along said axis;

a polygonal body centered on said axis and mounted on said housing;

a cup carried on said extremity, provided with a rim extending axially of said extremity for substantially the entire length of said body whereby said body is spacedly enveloped by said cup;

eccentric guide means near the bottom of said cup for thread to be wound upon said body said guide means being connected with said extremity; and

stationary braking means confronting the rim of said cup and defining therewith an exit gap for engaging thread unwinding from said body.

3,921,926
WINDING SHAFT WITH VARIABLE TORQUE

Willi Jöres, Opladen; Helmut Lehmann, Leverkusen, and Franz Hoffacker, Langenfeld, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

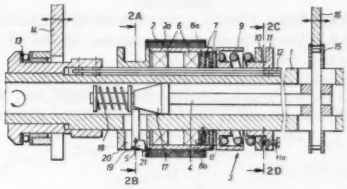
Filed Apr. 20, 1973, Ser. No. 352,965

Claims priority, application Germany, Apr. 25, 1972, 2220159

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B65H *19/04*

U.S. Cl. 242—56.9 **9 Claims**



1. Apparatus for winding bands on to cylindrical tubular supports, comprising a rotatable shaft having a plurality of winding sleeves each having a cylindrical surface adapted to carry a cylindrical tubular support and cause it to rotate with the sleeve, each sleeve being independently rotatable on the shaft and, associated with each sleeve, a friction drive from the shaft and means for adjusting the torque applied to the sleeve by the friction drive.

3,921,927
TAPE REEL

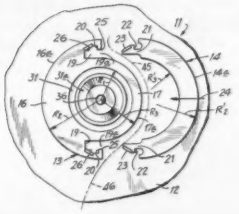
Hanjiro Esashi; Kiyosi Urayama, both of Sendai; Katsuyoshi Kawamata, Shiogama; Kokichi Sugawara, Shichigahama, and Junichiro Tobe, Tagajo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 20, 1974, Ser. No. 499,005

Claims priority, application Japan, Aug. 31, 1973, 48-102493

Int. Cl. B65h *75/28*

U.S. Cl. 242—74 **12 Claims**



1. A tape reel comprising:

a molded plastic resin spool member including a generally circular flange, and a generally cylindrical hub extending axially from said flange concentric with the latter, said hub including first and second substantially semi-cylindrical portions having the same inner radii and relatively large and small outer radii, respectively, so as to provide said first and second portions with relatively large and small radial thicknesses, respectively; a substantially semi-cylindrical sector of molded plastic resin having outer and inner radii substantially equal to said outer radii of said first and second portions, respectively, of the hub so that, in an operative position of said sector, the latter is closely engageable against the radially outer surface of

said second hub portion for securing a tape end portion therebetween and to provide, with said second hub portion, a total radial thickness substantially equal to said relatively large radial thickness of said first hub portion; and cooperatively engageable locking means on said hub and sector for holding the latter in said operative position thereof and thereby permitting the smooth winding of a secured tape on a cylindrical surface constituted by the radially outer surfaces of said first hub portion and said sector, respectively.

3,921,928

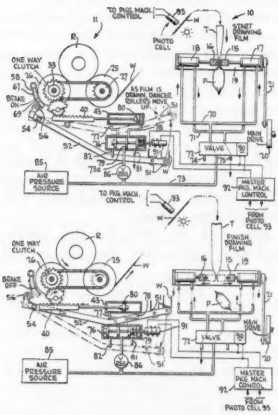
WEB ROLL CRADLE WITH POSITIVE DRIVE

Nelson R. Henry, Decatur, Ga., assignor to The Woodman Company, Inc., Decatur, Ga.

Continuation of Ser. No. 234,494, March 14, 1972, Pat. No. 3,787,001. This application Jan. 21, 1974, Ser. No. 435,246. The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.

Int. Cl. B65h *17/08, 75/02*

U.S. Cl. 242—75.43 **7 Claims**



1. The method of cyclic or intermittent feeding and unwinding of sheet material from a web roll comprising the steps of intermittently drawing a predetermined length of sheet material of said web roll supported on spaced support rollers, intermittently directly driving said web roll through said support rollers to the final turn of said roll to unwind a predetermined length of material substantially equal to that drawn and concurrently forming a slack loop between said web roll and said draw means varying from a minimum to a maximum slack loop, said direct driving step being initiated and performed substantially independently of the tension in said web, whereby the tension in said web remains at a minimum and substantially constant as determined by the formation of said slack loop and the duration of the driving step is substantially the same during each cycle regardless of the diameter of the web roll.

3,921,929

AUTOMATIC BAND-WINDING MACHINE

Willi Jöres, Opladen; Franz Hoffacker, Langenfeld; Bernhardt Kreit; Helmut Lehmann, both of Leverkusen, and Herbert Hardenbicker, Bergisch Gladbach, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

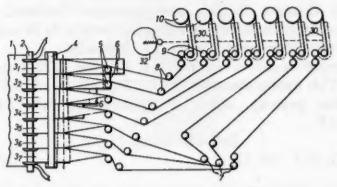
Division of Ser. No. 225,154, Feb. 10, 1972, Pat. No. 3,777,998. This application Sept. 12, 1973, Ser. No. 396,551

Claims priority, application Germany, Feb. 13, 1971, 2106865

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B65H *27/00, 19/04*

U.S. Cl. 242—76 **6 Claims**



1. A threading and securing device for an automatic band winding machine for a winding device for winding a length of said band upon a core, a movable threading and guiding unit operatively associated with said winding device for threading and guiding the end of a narrow band onto said winding device, a cutter on said movable threading and guiding unit for severing said band after a predetermined length has been wound onto a roll upon said winding device, said winding device having connected with it a motion providing device, said movable threading and guiding device being disposable in alignment with said winding device, said motion providing device having drive means for rotating said winding device, a winding starting casing operatively arranged for disposition about said winding head for guiding the starting end of said bands upon said core when disposed upon said winding head, translating means connected to each of said winding starting casings for engaging them about said winding head carrying a core to start the end of a band to be securely wound on said core about itself and for removing said winding starting casing after a winding has been securely started upon said roll, and said threading and guiding unit being movably mounted to freely guide said winding upon said core in an increasing diameter.

3,921,930

WINDING-UP DEVICE WITH AUTOMATIC LOCK INITIATED BY FRICTION FOR A SAFETY BELT

Artur Föhl, Schelmenwasenstrasse 68, 7061 Haubersbronn, Germany

Filed Mar. 22, 1973, Ser. No. 343,887

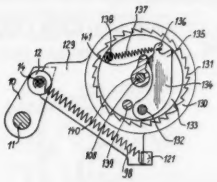
Claims priority, application Germany, Mar. 24, 1972, 2214307; June 19, 1972, 2229662

Int. Cl. B65h *75/48*

U.S. Cl. 242—107.4 **10 Claims**

1. In combination on a winding-up device for a safety belt; a housing, a winding-up shaft normally freely rotatable in the housing uniformly in both pay-out and take-up directions and connected to one end of a safety belt, a return spring biasing said shaft in take-up direction, locking means responsive to rotary acceleration of said shaft in pay-out direction for locking said shaft to said housing against rotation therein in pay-out direction, said locking means comprising a toothed member on said shaft, a pawl member tiltable in said housing and engageable with said toothed member, a release element carried by said shaft and engaging said pawl member and normally holding the pawl member spaced from said toothed member in pay-out direction and movable from the normal

position to enable said pawl member to move into engagement with said toothed member, an inertia body centrically journalled coaxial with said shaft and normally rotatable therewith, said inertia body rotating relative to said shaft in one



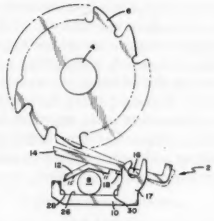
direction when said shaft is accelerated in pay-out direction, and coupling means operated by movement of said inertia body relative to said shaft in said one direction to couple said shaft to said release element.

3,921,931

VEHICLE SENSITIVE RETRACTOR WITH GAP IN BALL SENSING UNIT

Dornis Levasseur, Warren, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,566
Int. Cl.[1] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 **8 Claims**



1. A locking mechanism operated by inertia and adapted for use with one or more safety belts of the type wherein the safety belt is wound around a spool, said spool having a ratchet wheel, said locking mechanism comprising:

an inertia member adapted to be disposed in a rest position when said locking mechanism is inoperative and adapted to be displaced from said rest position by inertia;

a retaining base for said inertia member, said inertia member being supported on said retaining base;

a substantially conical actuation member having an open bottom, sides and a top, said actuation member disposed above said inertia member and centered over said rest position of said inertia member, means for spacing apart said actuation member from said inertia member when said inertia member is in said rest position, said actuation member movable by said inertia member; and

a locking dog affixed to said actuation member, whereby displacement of said inertia member from said rest position causes said locking dog to engage said ratchet wheel to restrain said safety belt against movement in the withdrawal direction; wherein:

at least a portion of said inertia member extends into said open bottom of said actuation member, a portion of said sides of said actuation member extending at least partially over and around at least a portion of said inertia member; said locking dog engages said ratchet wheel at one end of said locking dog and said locking dog has a pivot point at the opposite end of said locking dog from the end which engages said ratchet wheel, said actuation member affixed between said ends of said locking dog;

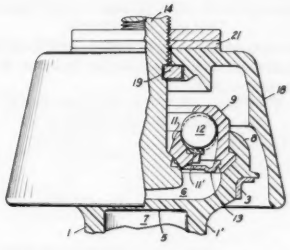
said actuation member is slightly tilted, thereby providing uniform sensitivity to the engaging action of the locking dog to the ratchet wheel; and the angle formed by the side of said actuation member adjacent the end of said locking dog having said pivot point with a vertical plane through the top of said actuation member being greater than the angle formed by the side of said actuation member adjacent the end of said locking dog which engages said ratchet wheel with the vertical plane.

3,921,932

BOBBIN HOLDER WITH INTERNAL BRAKE

Richard K. Whitehead, Sr., 2034 Deborah Drive, NE., Atlanta, Ga. 30345

Filed Aug. 26, 1974, Ser. No. 500,580
Int. Cl.[2] B65H *49/02;* **D03J** *5/08*
U.S. Cl. 242—130.2 **19 Claims**



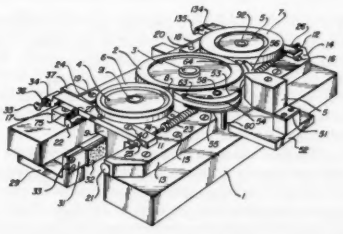
1. In a bobbin holder having a rotatable assembly for rotatably supporting a bobbin, a stationary assembly adapted to be suspended from a creel, and a ball bearing means rotatably supporting said rotatable assembly on said stationary assembly, the improvement comprising said ball bearing means including a race comprising polyurethane and an acetal resin.

3,921,933

TAPE TRANSPORT APPARATUS

Gerhard Rotter; Leonard S. Bleininger, both of Mission Viejo, and Robert L. Gertz, Laguna Hills, all of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 16, 1973, Ser. No. 388,929
Int. Cl.[2] G03B *1/04;* **G11B** *15/32*
U.S. Cl. 242—192 **18 Claims**



18. A tape transport apparatus comprising a pair of axles, each for carrying a reel of recording tape, the corresponding two reels forming supply and take-up reels, an annular rotating member rotatably mounted to the frame of said tape transport apparatus for simultaneously driving both said reels by surface engagement with the outermost layer of tape on each reel, two carriages each rotatably supporting the corresponding one of said axles, low-friction means between said car-

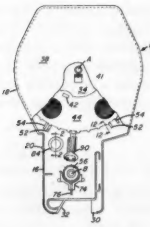
riages and said frame for enabling each said carriage to be bodily moved towards or away from said annular rotating member, means for yieldingly and substantially equally biasing both of said carriages toward said annular rotating member so that both said reels are simultaneously driven by surface engagement between said annular rotating member and the outermost layer of tape on each reel and that the carriage of the supply reel and that of the take-up reel are bodily moved towards and away from said annular rotating member, respectively, during the tape transporting operation, and selectively operable brake means for said reels, said low-friction means including two guideways mounted on opposite sides of the frame of said apparatus and three rollers carried by each said carriage, two of said rollers being journaled at spaced and relatively fixed points on one side of said carriage for engagement with one of said guideways and the third roller being journaled on the opposite side of said carriage and resiliently urged toward the other guideway for engagement therewith.

3,921,934

FILM CARTRIDGE

E. Everett Dorland; Stephen H. Miller, and Archie J. Tucker, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,714
Int. Cl.² G03B *1/04*; G11B *15/32*
U.S. Cl. 242—194 **11 Claims**



1. In a web-handling cartridge for use with apparatus for receiving said cartridge, said cartridge including a wall and first and second flanged web-handling spools coaxially mounted for independent rotation about an axis intersecting said wall, said spools being so arranged that a flange of said first spool adjoins a flange of said second spool, the improvement wherein said cartridge includes:

(a) an elongate spool locking member mounted for longitudinal movement between a first position wherein a portion of said locking member is operable to engage said flanges simultaneously to restrict rotation of said spools, and a second position relatively remote from said flanges;

(b) resilient means for urging said locking member toward said first position; and

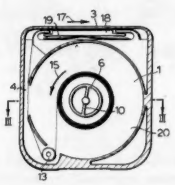
(c) actuator means, including a cam surface in engagement with said locking member, for moving said locking member toward said second position in response to said cartridge being received within said apparatus, said actuator means extending through said wall and exteriorly of said cartridge for contacting said apparatus when said cartridge is received therein.

3,921,935

RIBBON RECORDING APPARATUS

Johann Heinrich Springsits, 206 Dukes Court, 184 Beatrix St., Arcadia, Pretoria 0002, South Africa

Filed Jan. 31, 1974, Ser. No. 438,219
Claims priority, application South Africa, Feb. 7, 1973, 73/0850
Int. Cl.² G03B *1/04*; G11B *15/32*
U.S. Cl. 242—194 **4 Claims**



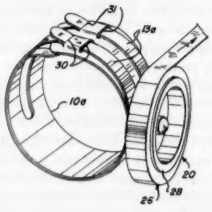
1. A cassette for a light sensitive ribbon on which information is to be recorded which comprises a casing having one and another chambers, a wind-off spool and a wind-on spool, one chamber being for containing a wind-off spool and the other chamber being for containing a wind-on spool, said casing having a region for recording information onto ribbon, means forming a passage from said one chamber to the region for recording information, means forming a passage from the region for recording information to said another chamber, friction reducing means for supporting ribbon in the aforesaid passages and the recording region, a wind-off spool for ribbon and a wind-on spool for receiving ribbon from said wind-off spool, said spools being coaxially rotatively mounted in said one and another chambers respectively, said casing having at least one hole for providing access to each spool for separately rotatively driving each spool, a lid having a window covering the recording region, the lid being removably mounted on said casing, the window in the lid being for exposing a portion of said ribbon for information to be recorded thereon and to be retrieved therefrom while the lid is closed, and means in said casing for shielding said passages and chambers against light transmission from the recording region.

3,921,936

MASKING TAPE DISPENSER

Ray K. Suter, 204 W. 50th, Loveland, Colo. 80537

Filed Apr. 1, 1974, Ser. No. 456,556
Int. Cl.² B65H *19/00*, *75/40*
U.S. Cl. 242—55.2 **5 Claims**



1. Apparatus for dispensing masking tape from a roll carried upon the lower arm of the user, comprising:

support means securable to the lower arm of the user;

an outwardly projecting pivot carried by said support means;

and a reel rotatable on said pivot and dimensioned to receive a roll of said masking tape, said reel including a radially-projecting rim only on the side of said reel opposite said support means.

3,921,937
PROJECTILE OR ROCKET PREFERABLY WITH UNFOLDED TAIL UNIT

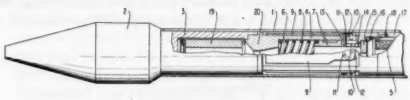
Alfred Voss, Cologne; Manfred Strunk, Neuenrade; Heinz Kroschel, Troisdorf-Sieglar, and Heinz Wilhelm Kreutz, Troisdorf-Oberlar, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed June 4, 1973, Ser. No. 366,755

Claims priority, application Germany, June 3, 1972, 2227104

Int. Cl.² F42B *13/32*

U.S. Cl. 244—3.27 **34 Claims**



1. A projectile comprising:

rudder carrier means extending in the direction of a longitudinal axis of the projectile,

at least one guiding fin means attached to said rudder carrier means, each of said guiding fin means being movable about a respective fin pivot axis extending substantially perpendicularly to said longitudinal axis between a first storage position extending tangentially along the rudder carrier means and a second-in-flight position extending outwardly of said rudder carrier means,

pivot lever means mounted on each of said fin means eccentrically with respect to a respective fin pivot axis,

and sliding sleeve means carried by said rudder carrier means, said sliding sleeve means being provided with annular groove means having a front lateral surface and a rear lateral surface for accommodating a free end of each pivot lever means, said sliding sleeve means being movable from a fin arresting position with said rear lateral surface engaging said pivot lever means to hold said fin means in said first position to positions with said front lateral surface engaging said pivot lever means to move said fin means to said second position.

3,921,938
HELICOPTERS

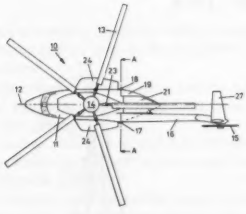
Robert John Jupe, and Walter Charles Joiner, both of Yeovil, England, assignors to Westland Aircraft Limited, England

Filed Aug. 27, 1974, Ser. No. 501,186

Claims priority, application United Kingdom, Aug. 28, 1973, 40553/73

Int. Cl.² B64C *27/50*

U.S. Cl. 244—17.11 **14 Claims**



1. A helicopter comprising in combination,

a fuselage,

a main rotor system including a plurality of main rotor blades, each of said main rotor blades being foldable forwardly to stowed position above a forward part of the fuselage,

an anti-torque rotor,

a tail boom supporting said anti-torque rotor adjacent to one end of said boom, and

attachment means for attaching the other end of said tail boom to a rear part of the fuselage, said attachment means comprising a generally vertical hinge located at one side of the fuselage so that, in a flying configuration, the said tail boom is offset from a longitudinal centerline of the fuselage and extends rearwardly and generally parallel to the centerline, and, in a stowed position, the said tail boom is folded about the hinge to a position in which said tail boom extends forwardly along the side of the fuselage and generally parallel to its longitudinal centerline.

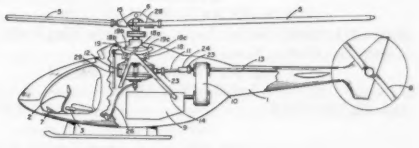
3,921,939
DIRECTIONAL CONTROL SYSTEM FOR HELICOPTERS

Marvin Garfinkle, Cleveland, Ohio, assignor to Helicorporation, Philadelphia, Pa.

Continuation of Ser. No. 370,842, June 18, 1973, abandoned. This application Jan. 28, 1975, Ser. No. 544,864

Int. Cl.² B64C *27/52*

U.S. Cl. 244—17.25 **7 Claims**



1. In a helicopter having an airframe;

a transmission and rotor shaft connected thereto;

a structural network movably connecting said transmission to said frame and including,

a pair of spaced parallel co-extending slide rods arranged laterally relative to the length of the helicopter;

support means securing said rods at each of the respective opposite ends thereof to said airframe;

support means slidably mounted on said rods for axial relative movement therebetween and connected to said transmission;

linkage means associated with said transmission for moving said transmission back and forth relative to said airframe laterally along and about said slide rods;

a curved support structure at each end of said rods and connected to the airframe;

roller means bearing upon said support structure;

linkage means connecting to said transmission for moving said transmission rotatable about said support structure to effect tilting thereof in a longitudinal direction;

a rotor engine supported stationary relative to the airframe; and power transmission means connecting to and between said engine and said transmission effective to accommodate angular and linear displacement of the transmission and rotor shaft relative to the airframe.

3,921,940
ASSEMBLY FOR CONNECTING A ROTOR TO A HELICOPTER

René Louis Mouille, Aix-en-Provence, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed May 29, 1974, Ser. No. 474,340

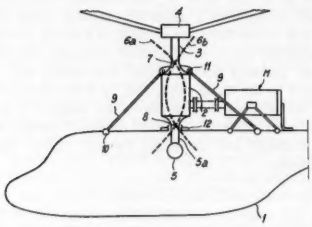
Claims priority, application France, June 8, 1973, 73.20960

Int. Cl.² B64C *27/00*

U.S. Cl. 244—17.27 **11 Claims**

1. An assembly for securing a main rotor of a helicopter to the fuselage therof, the assembly being adapted to prevent vibrations from being transmitted from the rotor to the fuselage, wherein the rotor mast and the elements rigidly secured thereto form a rigid but resiliently deformable, vertically

elongated system ballasted near its upper and lower ends and having at least one flexible vertically elongated intermediate portion, the system being adapted to vibrate in a vibration



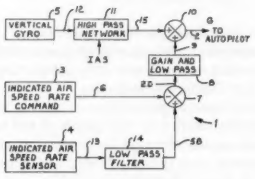
mode causing vibration nodes to appear in vertically spaced parts of the flexible vertically elongated portion, the connecting elements between such system and the fuselage being disposed at such vertically spaced nodes.

3,921,941

AIRCRAFT RATE TRIM SYSTEM

James J. Lehfeldt, Olathe, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed Aug. 23, 1973, Ser. No. 390,771
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 F **7 Claims**



1. An aircraft trim system comprising:
means for receiving an initiating command signal corresponding to indicated air speed rate;
means for receiving a signal from a first sensor and attenuating high frequency signal components from said first sensor signal thereby yielding a first filtered signal;
said first sensor signal corresponding to indicated air speed rate;
means for receiving a signal from a second sensor and attenuating low frequency signal components from said second sensor thereby yielding a second filtered signal;
said second sensor signal corresponding to the indicated pitch attitude of the aircraft;
first means for summing said initiating command signal with said first filtered signal;
means for shaping the output of said first summing means;
second means for summing the output of said shaping means with said second filtered signal, said second summing means providing an output signal for controlling a device which effects the trimming of the aircraft.

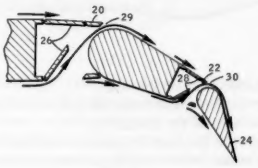
3,921,942

RUDDER BOUNDARY LAYER CONTROL DEVICE

Bruno W. Bracka, La Mesa, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed July 1, 1974, Ser. No. 484,633
Int. Cl.² B64C *21/02*
U.S. Cl. 244—87 **2 Claims**

1. In an aircraft fin and rudder structure, control means comprising:
a primary pivot carried by said fin;
a secondary pivot carried by said rudder;
a crank journaled at one end in said primary pivot and journaled at a second end in said secondary pivot;
a track carried by said fin and positioned fore and aft substantially at said fin's centerline;
sliding means carried by said rudder to reciprocate within said track;
at least one inlet door carried by said fin in each side skin, said doors hinged along their forward edge to open inward and spring biased outward to a closed position;
an actuator carried by said fin to rotate said crank about said primary pivot, causing said secondary pivot to move in an arc about said primary pivot and said sliding means to move in said track, displacing said rudder aft and



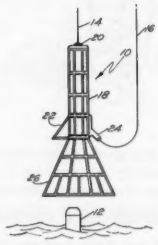
rotating said rudder angularly relative to said fin, thereby forming an exit gap between trailing edge of said fin and leading edge of said rudder on the suction side of said rudder;
a yoke journaled in said fin, said yoke containing at least one cam surface;
a cam follower adapted to engage said cam surface;
an inlet door positioner mounted to said cam follower and attached at opposite ends to opposing inlet doors located on each side of said fin; and
a rod connecting said yoke to said crank such that rotation of said crank causes rotation of said yoke, rotation of said yoke displacing said door positioner by means of said cam follower to open inwardly said inlet door on the pressure side of said fin.

3,921,943

DIVERLESS HELICOPTER WEAPON RECOVERY DEVICES

James M. Munro, North Kingstown, R.I.; David J. Pimental, South Dartmouth, Mass.; David J. Ramstad, Portsmouth, R.I., and John R. Hinves, Somerset, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1974, Ser. No. 502,257
Int. Cl.² B64D *1/22*
U.S. Cl. 244—137 R **3 Claims**



1. A diverless helicopter weapon recovery device for vertical floating torpedoes comprising:

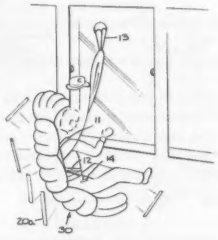
a barrel enclosed at one end and open at the other end;
a skirt connected to said barrel in axial alignment with said barrel, said skirt further comprises a first hoop having a first predetermined circumference connected to said barrel, a second hoop having a second predetermined circumference larger than said first predetermined circumference located at the end of said skirt opposite said first hoop and a plurality of bars connecting said first and second hoops;
a landing frame connected to said barrel;
a strongback connected to said barrel at a location diametrically opposed to said landing frame; and
connecting means connected to the device and adapted to be connected to lines for raising and lowering and changing the axial direction of the device; said connecting means further comprises a lifting ring connected to said one end of said barrel, an arm having an aperture, said arm located on said strongback, and first and second lines connected respectively to said lifting ring and said aperture.

2. A method of retrieving a vertical floating torpedo comprising the steps of:
lowering a framed cage in the vertical position from a helicopter over said vertical floating torpedo;
enclosing said torpedo with said framed cage in the water;
repositioning said framed cage to a horizontal position by means of slackening a line connected to the enclosed end of said cage and raising a line connected intermediate the ends of said cage; and
raising said framed cage out of the water.

3,921,944
INFLATABLE SAFETY PACK

Barclay Morrison, Morristown, N.J., assignor to John J. McNamara, Jr., New York, N.Y.

Filed Mar. 13, 1972, Ser. No. 234,239
Int. Cl.² B64D *17/78*
U.S. Cl. 244—138 **14 Claims**

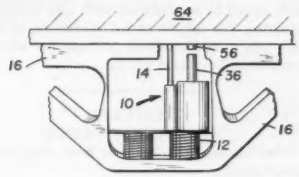


14. An impact absorbing inflatable safety package adapted to protect a person against impact forces which comprises:
a. a base means;
b. strap means coupled to said base means adapted to extend about the person and hold said base means with respect to the person;
c. inflatable means attached to said base means adapted to encapsulate the person upon inflation and thereby aid in absorbing impact forces;
d. means for inflating said inflatable means in response to a fall encountered by the person utilizing said package; and e. container means enclosing said inflatable means in the deflated condition, said container means including a substantially cylindrical shaped frangible outer skin embracing said inflatable means when deflated and adapted to rupture thereby releasing said inflatable means upon exertion of a predetermined force caused by inflation of said inflatable means.

3,921,945
TRAIN RESONANT CAR-BODY ROCKING DETECTOR SYSTEM

Frank H. Swaim, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 25, 1974, Ser. No. 491,983
Int. Cl.² B61L *3/00*
U.S. Cl. 246—169 R **25 Claims**

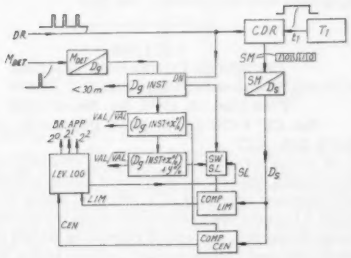


1. A motion sensor for detecting and registering motion to produce an output signal only for certain types of periodic motion comprising:
hydraulic fluid containment means;
a displaceable input means responsive to motion for applying pressure to the fluid in a first chamber of said containment means;
a displaceable extensible member in a second chamber of said containment means, said first and said second chambers in fluid communication;
flow control means to regulate fluid flow between said first and said second chambers; and
pressure relief means in said second chamber to regulate fluid flow from said second chamber,
whereby displacement of said input means pressurizes the fluid in said first chamber to displace said extensible member only when the input pressure exceeds the pressure relief from said second chamber.

3,921,946
VEHICLE SPEED CONTROL ARRANGEMENT

David John Norton, and John Douglas Corrie, both of London, England, assignors to Westinghouse Brake & Signal Co. Ltd., London, England

Filed July 23, 1974, Ser. No. 491,531
Claims priority, application United Kingdom, Aug. 18, 1973, 39147/73
Int. Cl.² B61L *3/08*
U.S. Cl. 246—182 A **39 Claims**



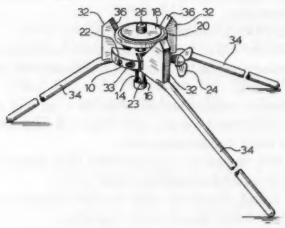
1. A vehicle speed control arrangement comprising a distance/speed inter-relationship profile storage means containing signals representing desired vehicle reference speed values at particular reference distance values for a predetermined vehicle position at which the distance/speed profile is to be applied

to the control of the vehicle, vehicle speed determining means coupled to the vehicle for determining the actual speed thereof, vehicle travel distance determining means coupled to the vehicle for determining the distance which the vehicle has travelled past said predetermined position, comparison means coupled to said speed determining means and to said travel distance determining means for comparing the actual speed/travel distance ratio with the desired value stored in said storage means to produce a resulting comparison, and vehicle speed control means coupled to said vehicle for controlling the vehicle speed in accordance with said resulting comparison to maintain the vehicle speed in relation to distance travelled past said predetermined position to within predetermined variations from said profile.

3,921,947
ADJUSTABLE TRIPOD

Alistair Peter Adam, 1159 N. Shore Blvd., Apt. 36, Burlington, Ontario, Canada

Filed Sept. 24, 1974, Ser. No. 508,781
Int. Cl.² F16M *11/38*
U.S. Cl. 248—169 **5 Claims**



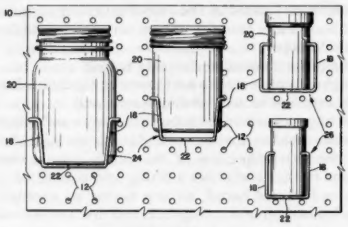
1. A tripod with an adjustable leg span comprising a body member, at least three legs pivoted to the body member about respective horizontal pivots, a common cam member having a cam face and mounted by the body member for movement above the body member along an axis that in operation of the tripod is at least substantially vertical, means for locking the cam member at any selected position along the said axis above the body member between two limit positions, and a leg cam member on each leg having a respective leg cam face extendable above the body member and engageable with the said common cam face to position the associated leg about the respective pivot axis and determine the maximum straddle of the legs, whereby the weight of the tripod and a device supported thereby will urge the leg cam faces into operative engagement with the common cam face.

3,921,948
PEGBOARD CONTAINER HOLDER

J. C. Long, 90 Broad St., Charleston, S.C. 29402

Filed Mar. 18, 1974, Ser. No. 452,005
Int. Cl.² A47G *23/02*; A47B *3/00*; A47F *5/00*
U.S. Cl. 248—223 **2 Claims**

1. A holder for detachably mounting an article on a generally vertically disposed support board having a multiplicity of small apertures consisting of a length of spring wire bent to provide a laterally open article embracing section and a board attachment section, said article embracing section comprising laterally opposed complementary resilient spring loaded loop jaw means that extend away from said board attachment section for embracing and tightly grasping and receiving the article, whereby articles of widely varying diameter may be mounted in said holder on the support board, and said board attachment section comprising the opposite ends of said wire extending from said jaw means and conformed and spaced at the terminals to extend through a pair of selected board apertures and engage the rear side of the board, said laterally opposed complementary resilient spring loaded loop jaw means being interconnected at their lower ends to provide seating means for underlying an article embraced by said jaw

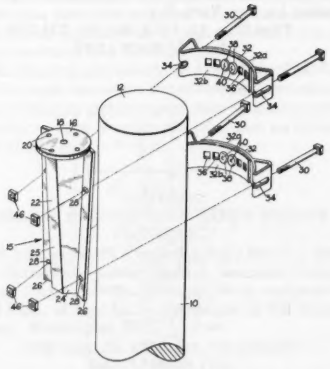


means, said seating means comprising an intermediate loop in said wire adapted to extend from the lower edges of the respective jaw means toward the board and a pair of board attachment anchors spaced to extend through a pair of selected board apertures.

3,921,949
POLE TOP INSUALTOR MOUNTING BRACKET

James D. Coon, Portland, Oreg., assignor to Western Power Products, Inc., Hood River, Oreg.

Filed Nov. 21, 1973, Ser. No. 417,893
Int. Cl.² H02G *7/20*; H01B *17/12*
U.S. Cl. 248—221 **3 Claims**



1. A single insulator mounting bracket for supporting an insulator at the top of a power pole comprising:

a. a top plate having top and bottom surfaces,

b. means in said plate for securing an insulator in supported relation on the top surface thereof,

c. a single body member depending integrally from said top plate arranged for mounting engagement against one side only of a pole,

d. said body member comprising a single piece of metal plate bent to form in cross section a longitudinal channel-shaped member having a pair of side walls and a connecting wall,

e. said side walls of said body member having lesser width toward the bottom wherein said body member is tapered to less depth in upright direction toward the lower end thereof,

f. said body member also comprising longitudinal flange extensions on said side walls bent angularly thereto in an outward direction,

g. the overall width of said bracket between the outer edges of said flange extension being tapered to a narrowed dimension toward the bottom,

h. said body member being arranged to be mounted on a pole with the open portion of the channel facing the pole, i. and one or more bolts extending from said bracket and arranged to be secured to a post.

3,921,950
EXTINGUISHER MOUNTINGS

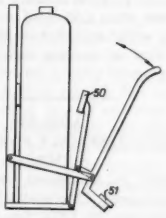
Victor Edward Sentinella, 68 Dome Hill, Caterham, Surrey, England

Filed Apr. 11, 1974, Ser. No. 460,174

Claims priority, application United Kingdom, Apr. 12, 1973, 17774/73; Oct. 18, 1973, 11384/73

Int. Cl.² A62C *33/00*, *39/00*

U.S. Cl. 248—313 **5 Claims**



1. A mounting for a fire extinguisher comprising:

a spine member including fixing means adapted to fasten said member in an upright position to a support,

an extinguisher base support projecting horizontally from the bottom of said spine member,

gripper lever means pivotally mounted on said base support remote from said spine member for movement towards and away from said spine member,

pressure plate means mounted on the distal end of said lever means,

tension lever means pivotally mounted at one end on said spine member,

linkage means pivotally connected between said gripper lever means and said tension lever means, and

manual operating means interconnected with said linkage and levers and arranged to move said linkage and levers to an over-centre position to grip said extinguisher.

3,921,951
LATERAL ROLL SUSPENSION

Simon Blok, Hulsberg, Netherlands, assignor to Laura & Vereeniging N.V., Eygelshoven, Netherlands

Filed Apr. 29, 1974, Ser. No. 465,367

Claims priority, application Netherlands, Apr. 27, 1973, 7305947

Int. Cl.² F16M *13/00*; A61G *3/00*

U.S. Cl. 248—373 **5 Claims**

1. An apparatus for supporting a load to be subjected to translational forces comprising the combination of

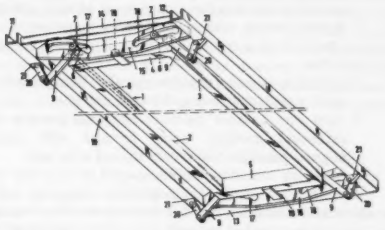
a supporting frame;

a load carrier;

first and second support members both attached to one end of said load carrier and said supporting frame, said members being spaced apart in the direction of the forces;

first and second means mounted on the other one of said load carrier and said supporting frame for supporting said load carrier and for guiding said first and second support members, respectively, along separate and different substantially elliptical path of transverse movement in response to application of the forces,

said paths of transverse movement being substantially symmetrical with respect to a vertical plane containing the center of gravity of the load and load carrier when the load carrier is at rest, the major axes of the ellipses containing said paths forming an oblique angle such that the



axes perpendicular to said major axes intersect said plane above said center of gravity; and

third and fourth support members and third and fourth means for supporting and guiding at the other end of said carrier.

3,921,952
TELESCOPING COLUMN ASSEMBLY

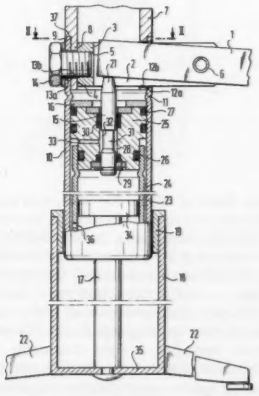
Winfried Wirges, Koblenz-Moselweiss, Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed July 1, 1974, Ser. No. 484,405

Claims priority, application Germany, July 5, 1973, 2334180

Int. Cl.² F16M *11/00*

U.S. Cl. 248—404 **8 Claims**



1. A column assembly comprising:

a. two telescopically engaged column members having a common axis and axially movable relative to each other;

b. releasable arresting means in one of said column members for preventing relative axial movement of said members, said arresting means including a releasing member,

1. said one column member being formed with an opening transverse to said axis and giving access to said releasing member;

c. operating means for operating said releasing member, said operating means including

1. an approximately U-shaped, unitary bracket member having two leg portions passing through said opening and a bight portion in the interior of said one column

member, said bight portion connecting said leg portions,

2. a lever member having respective arm portions in said interior and outside column member, said lever member passing through said opening, and
3. pivot means securing said lever member to said bracket member for movement in a plane passing through said releasing member for engagement of said arm portion in said interior with said releasing member;

d. a tubular extension member coaxial with said one column member,

1. a portion of said extension member being axially coextensive with said one column member,
2. said one column member and said portion of said extension member being formed with respective aligned passages transverse to said axis; and

e. a fastening member passing inward of said one column member through said passages and engaging said bight portion in said interior for thereby axially securing said extension member to said one column member and to said bracket member.

3,921,953

COMBUSTIBLE CORE WITH INTERIOR PIPE HOLDING MEANS

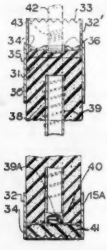
Erhard Armin Diener, Saskatoon, Canada, assignor to Industrial Development Bank, Saskatoon, Canada

Filed Feb. 7, 1974, Ser. No. 440,589

Claims priority, application United Kingdom, Feb. 19, 1973, 08055/73

Int. Cl.² B28B *7/34*

U.S. Cl. 249—62 **10 Claims**



1. A vent forming device for walls and floors of concrete and the like adapted to be embedded in the wall or floor when same are poured; comprising in combination a substantially cylindrical sleeve, a core of semi-rigid material within said sleeve, flammable means extending through said core which, when ignited, partially melts said core, and igniting means connected to said flammable means and extending from one end of said core for igniting said flammable means, said flammable means including a rigid flammable form extending axially within said core, but terminating spaced from the ends thereof and an ignitor card spirally wound around said form and extending from one end thereof to the other, one end of said ignitor cord extending from one end of said sleeve and constituting said igniting means.

3,921,954

MOLDING APPARATUS FOR MAKING AN INTRAUTERINE DEVICE

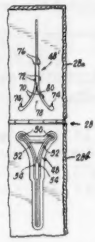
Edward Monett, Westfield, N.J., assignor to Roller Corporation of America, South Plainfield, N.J.

Filed Aug. 6, 1973, Ser. No. 385,681

Int. Cl.² B22D *19/08*

U.S. Cl. 249—88 **4 Claims**

1. A mold for molding an intrauterine device comprising means defining an elongated channel in the mold for holding an intrauterine device preform element and into which channel molding material is introduced, and a plurality of pins, said channel having sides extending to points inside of and substantially co-terminus with the surface of each of said pins, said



pins retaining said preform element in position prior to mold closure such that when said mold is closed said preform element is entirely within said channel and said pins do not interfere with the flow of molding material about said preform element.

3,921,955

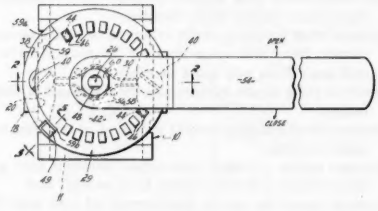
POSITIONING ASSEMBLY FOR VALVE CLOSURE MEMBERS

Joseph J. Haddad, Jr., Cincinnati, Ohio, assignor to The Lunkenheimer Company, Cincinnati, Ohio

Filed Jan. 28, 1974, Ser. No. 437,191

Int. Cl.² F16K *35/04*

U.S. Cl. 251—297 **11 Claims**



1. A valve positioning assembly for use in combination with a valve including a housing providing a passage for the flow of fluids therethrough, a valve closure member movably mounted within said passage between an open position and a closed position, a valve stem rotatably mounted in said housing and interconnected to said closure member for moving said closure member relative to said passage, and a handle secured to said stem, said valve positioning assembly comprising in combination:

a first plate rigidly attached to the exterior of said valve housing having an opening through which said stem passes perpendicular to the plane of said plate and a detent extending upwardly therefrom, said detent being spaced from said stem; and

a second, resilient plate mounted on said stem above said first plate and having a plurality of spaced detents extending upwardly therefrom defining said open position and said closed position, said detents on said first and said second plates being interengageable and operative to hold said valve closure member in said open and closed positions, said second plate further including:

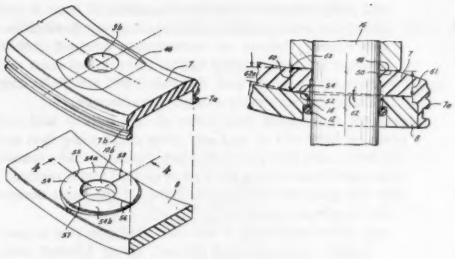
a plurality of detents corresponding to a plurality of intermediate throttled positions and said detents on said first and second plates are further operative to hold said valve closure member in said intermediate throttled positions.

3,921,956

SHAFT SEALING MEANS FOR BUTTERFLY VALVE

John Michael Hinrichs, Houston, Tex., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 25, 1974, Ser. No. 464,119
Int. Cl.[2] F16K *1/226, 1/32*
U.S. Cl. 251—306 6 Claims



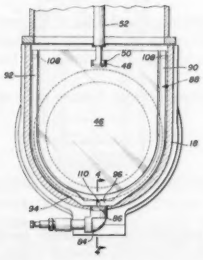
1. A butterfly valve having a body forming a flow passage with diametral shaft openings, a valve disc including aligned shafting portions journalled in said openings, resilient liner means interposed between said body and said disc including generally tubular bearing portions surrounding and sealing said shafting portions, each corresponding pair of said shafting and liner bearing portions having compressively and slidably abutting end thrust bearing surfaces surrounding and sealing said shafting portions, liner backup structure, said liner bearing portions and backup structure having complementary abutting surfaces inclined, at least in part, to a plane normal to the axis of said shafting portions so that said liner portions, at least in part, are of decreasing thickness and, therefore, increasing compressive resistivity as said valve disc approaches its closed position.

3,921,957

MEANS TO MINIMIZE BINDING OF SLAB GATE VALVE

John W. Freeman, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,888
Int. Cl.[2] F16K *3/316*
U.S. Cl. 251—327 6 Claims



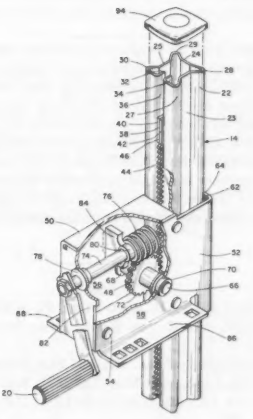
1. A gate valve structure having a valve body with a gate chamber therein, a nonported slab gate valve member disposed within the valve chamber and being movable between open and closed positions to control the flow of fluid through the valve with the gate valve member being of a uniform thickness, means for moving the gate valve member between open and closed positions, a pair of spaced opposed movable seat assemblies within the valve chamber having sealing faces thereof in sealing engagement with the gate valve member in the closed position of the valve, a generally U-shaped integral spacer member loosely positioned within the valve chamber between the seat assemblies and being spaced from the outer peripheral surface of the gate valve member, the U-shaped spacer member being of substantially the same thickness as the thickness of the gate valve member to maintain a predetermined minimum spacing between the seat assemblies, said U-shaped spacer member having a lower intermediate section thereof supported on the lower wall of the valve body, said intermediate section of the U-shaped spacer member having a reduced width and thickness to provide flexibility to the generally parallel sides of the spacer member for permitting relative movement between the sides of the spacer member to minimize misalignment of the gate valve member with respect to the seat assemblies.

3,921,958

TONGUE JACK

Norman D. Brockelsby, Grand Island, and Reinhold A. Haase, Hastings, both of Nebr., assignors to Dutton-Lainson Company, Hastings, Nebr.

Filed Mar. 24, 1975, Ser. No. 561,154
Int. Cl.[2] B60S *9/02*; B66F *3/16*
U.S. Cl. 254—86 R 13 Claims



1. An improved jack comprising, in combination:
a post assembly including a post, said post including a vertical slot with a rack therein having outwardly extending teeth retained in said slot; and
a housing assembly slidably mounted on said post, said housing assembly including a pinion cooperative with said rack; and
means for driving said pinion and translating said housing relative to the post assembly.

3,921,959

LOAD BALANCER AND HOIST CONTROL

Otmar M. Ulbing, Webster, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

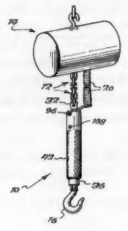
Filed July 22, 1974, Ser. No. 490,233
Int. Cl.[2] B66D *1/48*
U.S. Cl. 254—168 15 Claims

14. A control attachment for remotely controlling and providing balancing capabilities for a hoist of the type having actuating means for effecting raising and lowering of a load lift hook via a load lift chain, said control attachment comprising in combination:
a first part attachable to said load lift chain;

a second part attachable to said load lift hook;

means for supporting said second part on said first part while permitting movement of said second part relative to said first part in response to the application to said hook of a load to be lifted by said hoist and the application of a vertically directed manually applied force to said load; switch means operable for effecting load lift hook raising and lowering operations of said hoist actuating means; and

a manual control member supported by one of first part and said second part for manually induced movements relative thereto from an inoperative position alternately into raising control and lowering control positions for operating said switch means for effecting load lift hook raising and lowering operations of said hoist actuating means, and raising and lowering movements of said second part relative to said first part resulting from the application of vertically directed manual forces to said load while said control member is in said inoperative position operating said switch means for effecting load lift hook raising and lowering operations of said hoist actuating means, respectively.



3,921,960

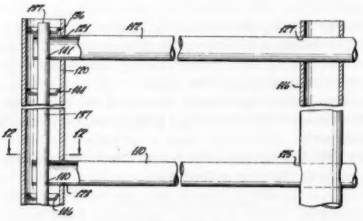
TUBULAR RAIL AND POST FENCING

Ralph W. Bright, 18888 Van Buren Blvd., Riverside, Calif. 92504

Continuation-in-part of Ser. No. 152,064, June 11, 1971, abandoned. This application May 21, 1973, Ser. No. 362,270

Int. Cl.[2] E04C *3/32;* **E04H** *17/14*

U.S. Cl. 256—65 **18 Claims**



1. A fence section comprising:

a plurality of mutually spaced intermediate tubular posts, each said post having a number of mutually spaced transverse apertures extending completely therethrough,

a plurality of continuous tubular rails, each rail extending freely through corresponding apertures in all of said intermediate posts, and each said rail extending substantially beyond both sides of said intermediate posts for connection to an end post,

first and section tubular end posts respectively positioned at opposite sides of said fence section,

each said end post having an aperture therein corresponding to a like aperture in an adjacent one of said intermediate posts,

said apertures in said end posts receiving portions of respective ones of said rails that extend beyond an intermediate post,

each said rail being a close but sliding fit within its corresponding apertures in each of said intermediate and end posts, whereby said fence section, at least in and about the intermediate posts, is relatively flexible and will readily deform to accomodate uneven ground contour by experiencing limited motion between said intermediate posts and the rails that are supported thereby and moveably extend therethrough,

means for securing at least some of said rails to said end posts, at least one of said end posts comprising first and second fixedly interconnected gate posts mutually spaced from each other along the extent of said fence section,

said first gate post having said end post apertures therein for receiving said rails,

one of the apertures of said first gate post that is positioned near one end thereof, being formed completely through said first gate post and having one of said rails extending entirely therethrough towards said second gate post, said second gate post having an aperture in one side thereof receiving said one rail,

said means for securing said rails to said end posts comprising

means for locking at least some of said rails to said first gate post, and means for locking said one rail to said second gate post.

3,921,961

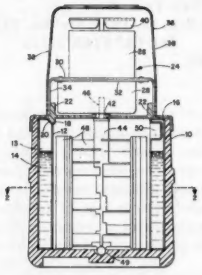
HOME FREEZING APPLIANCE

William H. Hapgood, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 352,761, April 19, 1973, abandoned. This application Mar. 27, 1974, Ser. No. 455,157

Int. Cl.[2] B01F *7/16;* **F25D** *3/08*

U.S. Cl. 259—67 **5 Claims**



1. A freezer comprising a container having an open upper end, a receptacle removably located within the container and having an open upper end, a cover removably mounted over the open upper ends of said container and receptacle in closing relation thereto, said cover being a substantially planar disclike member having a central opening, a downwardly turned outer peripheral flange engaging the circumferential end portion of the container, and at least one projection extending downwardly from and engaging a comating recess in the adjacent end of the receptacle for preventing rotation of the receptacle with respect to the cover, a motor assembly mounted on said cover, a dasher within the receptacle and having drive means extending upwardly through the central opening in the cover into operative engagement with the

motor assembly, and a housing enclosing said motor assembly and removably mounted on said cover.

3,921,962

SHAFT MOUNTING FOR CEMENT MIXER OR THE LIKE

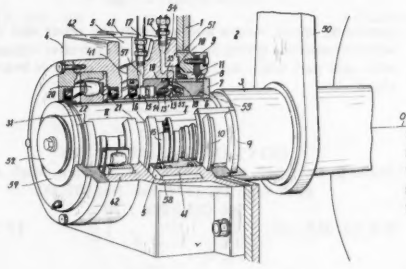
Herbert Feger, Bruchhausen, and Paul Hanns, Reichenbach, both of Germany, assignors to Elba Werk, Maschinen-Gesellschaft mbH & Co., Ettlingen, Germany

Filed Nov. 5, 1974, Ser. No. 521,097

Claims priority, application Germany, Nov. 10, 1973, 2356263

Int. Cl.² B28C 5/14

U.S. Cl. 259—178 R **10 Claims**



1. In machinery including a mixing chamber for flowable material and a stirrer therefor in said chamber rotatable about a substantially horizontal axis, in combination:

a substantially vertical chamber wall provided with an aperture;

a substantially horizontal shaft connected to the stirrer and provided with an extremity passing through said aperture;

a generally cylindrical housing centered on said extremity and secured to said wall, said housing being axially subdivided into a first cylinder close to said wall surrounding a first compartment and a second cylinder remote from said wall surrounding a second compartment;

a packing assembly in said first compartment including a rotatable section extending into said aperture and a non-rotatable section axially slidable in said first cylinder;

abutment means independent of said housing maintaining a substantially constant axial distance between said sections;

annular gasket means in said first cylinder engaging said rotatable section for preventing migration of flowable material via said aperture to section said second cylinder; and

bearing means in said second section supporting said extremity.

3,921,963

INJECTION MOLDING MACHINE CONSTRUCTION AND METHOD OF OPERATION

Engelbert Neff, Zollikon, and Jakob Fehr, Mollis, both of Switzerland, assignors to Maschinenfabrik u. Giessuel Netstal AG, Switzerland

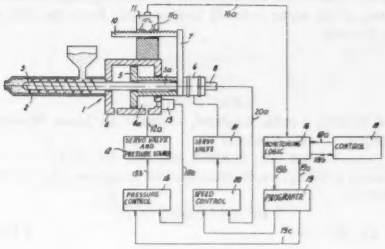
Filed Mar. 4, 1974, Ser. No. 445,463

Claims priority, application Switzerland, Mar. 9, 1973, 3476/73

Int. Cl.² B29B 1/06

U.S. Cl. 259—191 **5 Claims**

1. An injection molding machine comprising an injection cylinder having a discharge, a fluid pressure operated plasticizing injection screw axially movable and rotatable in said cylinder, fluid pressure operated means for advancing said screw, means connected to said screw to rotate said screw, pressure sensing means for sensing the pressure of said fluid pressure means during the advancing movement of said screw, distance sensing means connected to said screw for sensing the movement distance of said screw, feed sensing means connected to said screw for sensing the rotational speed of said screw, and a programmable device connected to each of



said pressure sensing means, said distance sensing means and said rotational speed sensing means and simultaneously controlling the rotational speed of said screw and said fluid pressure above the operating pressure as a function of the screw travel distance during the plasticizing and dosing operation.

3,921,964

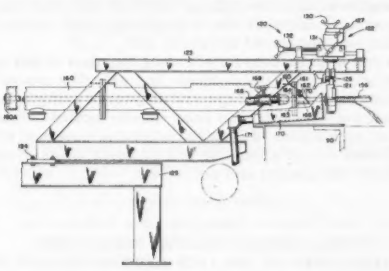
WATER QUENCH APPARATUS FOR COATED TUBING AND THE LIKE

Joseph R. Rossi, Cortland; Frederick J. Griffiths, Warren, both of Ohio; James L. Griffin, Jackson Center, Pa., and Gormen C. Palleson, Naperville, Ill., assignors to Maneely-Illinois, Inc., Chicago, Ill.

Division of Ser. No. 248,739, April 28, 1972, Pat. No. 3,845,540. This application June 21, 1974, Ser. No. 481,514

Int. Cl.² C21D 1/64

U.S. Cl. 266—6 R **5 Claims**



1. A water quench apparatus for cooling and setting coated tube comprising a trough having inlet and outlet walls substantially normal to the direction of tube travel, such walls respectively having axially aligned inlet and outlet orifices through which the tubing continually passes, means in said outlet aperture to establish a seal between the tubing and the outlet wall, means for introducing water at the outlet end of the trough for movement through said trough in a direction countercurrent to the direction of tube travel, means to sense the temperature of the water at the trough inlet, and means for controlling the flow rate and temperature of the water as it passes along the trough and through the inlet orifice of the trough to achieve a predetermined sensed temperature range for the water at the trough inlet and to provide a continuously maintained decreasing temperature gradient from trough inlet to trough outlet.

5. A water quench apparatus for cooling and setting coated tube moving therethrough comprising a housing having inlet and outlet walls substantially normal to the direction of tube

travel, such walls respectively having inlet and outlet orifices through which the tubing continuously passes, means for introducing water into the housing for movement at the housing inlet in a direction countercurrent to the direction of tube travel, and a nipple mounted to the inlet wall of the housing, said nipple having a bore complemental to and in registry with the inlet orifice and having a bias cut leading edge so that the bottom of the same extends farther away from the inlet wall than the top.

3,921,965

LEAF SPRINGS

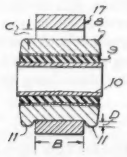
Peter Skerry, Leeds, England, assignor to Jonas Woodhead Limited, Leeds, England

Filed Oct. 1, 1973, Ser. No. 402,077

Claims priority, application United Kingdom, Oct. 3, 1972, 45508/72

Int. Cl.² B60G 11/16

U.S. Cl. 267—47 **3 Claims**



1. A multi-leaf spring comprising:

a. an uppermost leaf, said uppermost leaf having a main length, an end portion and an eye curled from said end portion,

b. a lower leaf, said lower leaf having a main length, an end portion and a loop bent from said end portion and extending around said eye, said loop being elongated in the lengthwise direction of the spring leaves to provide a part parallel to said main length of said lower leaf leading to said loop and spaced therefrom, and

c. a pair of projections formed along the edges of said uppermost leaf on the underside and extending around a curved portion of said eye, said projections strengthening said eye, said lower leaf being slidably located between said projections and limited to lengthwise movement with respect to said uppermost leaf by lateral edges of said lower leaf abutting said projections.

3,921,966

PLURAL RANGE PRESSURE REGULATOR CONSTRUCTION OR THE LIKE AND THE METHOD OF MAKING THE SAME OR THE LIKE

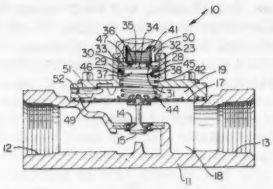
Francis S. Genbauffe, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 320,520, Jan. 2, 1973, Pat. No. 3,825,029. This application May 16, 1974, Ser. No. 470,433

Int. Cl.² F16F 1/06

U.S. Cl. 267—166 **5 Claims**

1. A plural range biasing construction comprising a housing means having a movable part, and biasing means carried by said housing means for acting on one side of said movable part to tend to move said part in one direction relative to said housing means, said biasing means comprising a plurality of separate spring means each acting on said part to provide one biasing range for said construction, said housing means having a storage space for storing one of said spring means so that the same will not act on said part whereby the remaining spring means acting on said part will provide another biasing range for said construction said one spring means and said remaining spring means being coiled compression springs and being concentrically disposed when acting on said part to provide said one biasing range for said construction, said springs each having one end thereof operatively engaging said part when providing said one pressure range, said storage space for said one spring means being located in aligned relation with said



remaining spring means and adjacent the other end thereof whereby said one spring means is out of operative engagement with said part when said other pressure range is being provided.

3,921,967

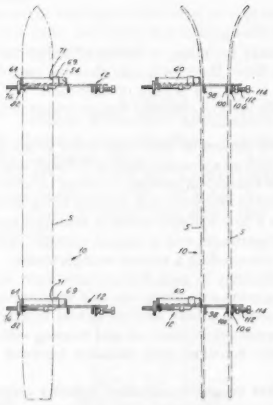
SKI CLAMPING APPARATUS

James B. Campbell, 5215 Arden Ave., Warren, Mich. 48092

Filed Sept. 19, 1974, Ser. No. 507,351

Int. Cl.² B25B 1/20

U.S. Cl. 269—43 **17 Claims**



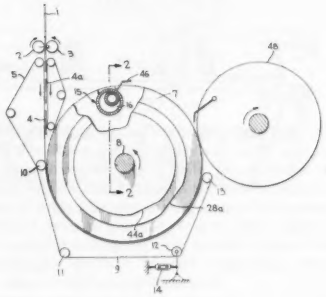
1. A clamp adapted to be mounted on a support for holding a workpiece comprising a base plate having a web which is provided with a pair of sides, said web having a top edge, a bottom edge and a pair of side edges, a support flange secured to the bottom edge of said web, means for mounting said base plate on the support with said support flange engaging same, the side edges of said web being provided with first and second flanges which are spaced apart and extend in opposite directions from said web, a top flange secured to said web at the top edge thereof and forming a surface for supporting the workpiece, said top flange and said first flange being located at one of the sides of said web, the end of said top flange remote from said first flange being provided with an abutment forming a first stop surface for the workpiece, said second flange being located at the other side of said web, a clamp plate mounted on said base plate adjacent said other side of said web and movable relative to said second flange, first actuating means interposed between said base plate and said clamp plate for moving said clamp plate, said clamp plate including at the upper edge thereof a clamping flange which extends across said top flange, said clamping flange having an abutment forming a second stop surface for the workpiece and which cooperates with said first stop surface to form a first clamping

section, said clamping flange being movable with said clamp plate upon actuation of said actuating means so as to move said second stop surface relative to said first stop surface to hold or to release a workpiece therebetween.

3,921,968
SHEET ASSEMBLING APPARATUS

Hermann Thomas, Darmstadt; Heinz Kreiter, Darmstadt-Arheilgen, and Friedrich Weber, Kilsbacherweg, all of Germany, assignors to Maschinenfabrik Goebel GmbH, Darmstadt, Germany

Filed Nov. 12, 1973, Ser. No. 414,944
Claims priority, application Germany, Nov. 10, 1972, 2255043
Int. Cl.² B65H *39/08*
U.S. Cl. 270—60 **4 Claims**



1. Apparatus for assembling at least two sheets one on top of the other, comprising a cylinder having a peripheral wall and being mounted for rotation about its longitudinal axis, sheet gripping means comprising a shaft parallel to said cylinder axis and having at least one gripping finger mounted thereon and extending outwardly so as to bear against said peripheral wall, a hollow carrier member parallel to said shaft and being mounted for rotation on said cylinder, said shaft being eccentrically mounted within said carrier member for rotation about a longitudinal axis of said shaft as well as about a parallel axis slightly spaced from said shaft axis, said finger extending outwardly through an opening provided in said carrier member and in said peripheral wall, sheet guide and retention means comprising at least one strip located adjacent said peripheral wall, said strip extending along at least one quadrant of said cylinder, means for feeding sheets sequentially between said strip and said peripheral wall, each of the sheets at a leading edge thereof being made in the first instance to overlie said finger, means for rotating said shaft about said shaft axis as well as about said parallel axis for movement of said finger between its position bearing against said peripheral wall to a shifted position along said wall and a position extending outwardly of said peripheral wall and back to a position holding down the sheets against said peripheral wall.

3,921,969
LEAD SCREW DOCUMENT TRANSPORT

Richard C. Hickey; John H. Bond, both of Plano, and Tandy P. Watson, Grand Prairie, all of Tex., assignors to Docutel Corporation, Dallas, Tex.

Filed June 24, 1974, Ser. No. 482,556
Int. Cl.² B65H *5/04*
U.S. Cl. 271—3 **20 Claims**

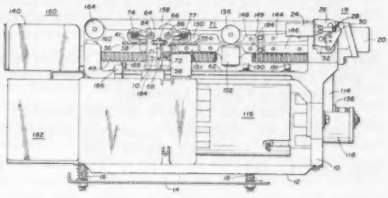
8. Apparatus for transporting an encoded document to and from reading and encoding stations, comprising in combination:

a transport frame;

a guide as a part of said transport frame;

a document carriage for carrying the encoded documents to and from the reading and encoding stations in said guide;

pressure rollers rotatably mounted to said carriage to position the encoded document in an established plane relative to the reading stations and encoding stations;



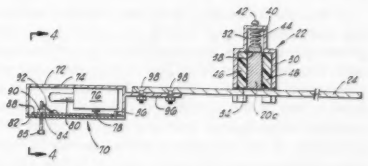
pressure means mounted on said document carriage to engage an edge of an encoded document to bias the document into said guide; and

drive means coupled to said document carriage to cause movement thereof to and from the reading stations.

3,921,970
PAPER FEED REGULATING ASSEMBLY FOR PRESSES AND DUPLICATORS

Jay E. Stanfield, P.O. Box 333, Guymon, Okla. 73942

Filed May 31, 1974, Ser. No. 474,975
Int. Cl.² B65H *1/14, 3/08*
U.S. Cl. 271—31 **35 Claims**



29. An assembly for regulating the feeding of paper to a copying machine comprising:

a paper feed table;

means for elevating the paper feed table;

a microswitch assembly spaced vertically from, and disposed over, the paper feed table, said microswitch assembly comprising;

housing means;

a microswitch mounted in the housing means and including a downwardly facing switch contact vertically movable to open and close the microswitch;

a spring plate mounted as a cantilever in said housing means, and extending across and touching at a point intermediate its length, said switch contact, for moving the switch contact from a normally open to a closed position when said spring plate is pushed vertically upwardly against said switch contact; and

manually adjustable microswitch closing means operatively associated with said microswitch and spring plate in said microswitch assembly for manually selectively adjusting the closure of said microswitch in correlation to the height of a stack of papers on said feed table, said microswitch closing means including contact means projecting downwardly below said spring plate for contact by the uppermost sheet of paper in a stack of paper carried on said feed table;

a solenoid connected to said microswitch for actuation when said microswitch is closed; and

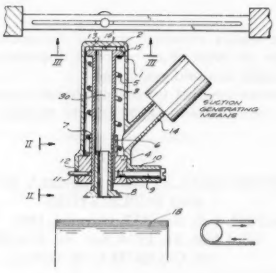
a mechanical linkage connected between said solenoid and said means for elevating the feed table for inactivating said elevating means when the status of energization of said solenoid is changed.

3,921,971

SUCTION DEVICE FOR SEPARATING AND/OR TRANSPORTING SHEETS IN A SHEET-HANDLING MACHINE

Karl-Hans Vollrath, Leipzig, Germany, assignor to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed June 28, 1974, Ser. No. 484,452
Claims priority, application Japan, Aug. 4, 1973, 48-91668
Int. Cl.² B65H *3/08*
U.S. Cl. 271—103 **10 Claims**



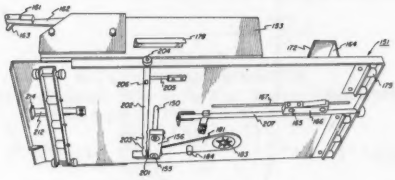
2. In a sheet-handling machine, a suction device for engaging and then holding sheets, comprising, in combination, a pneumatic cylinder; a hollow piston unit in said cylinder movable between a retracted and a non-retracted position and comprised of axially adjacent first and second portions, at least a part of the circumferential periphery of each of said portions being spaced from and out of contact with the inner periphery of said cylinder to define therewith respective first and second spaces, said piston unit including a sheet-engaging portion having a suction opening which communicates with the ambient atmosphere and constitutes the end of the hollow interior of said piston unit, said hollow interior communicating with said second space via said first space, said cylinder being provided with a suction port opening into said second space to form a path for the flow of ambient air into said suction opening and out through said port, the flow cross section of said first space being smaller than that of said second space so that said first space constitutes a flow restriction in said path; and drive means for causing said piston unit to move from retracted to non-retracted position and then back to retracted position, in order to cause said sheet-engaging portion to move into engagement with a sheet located in the path of movement of the latter and then hold said sheet by suction during the movement of said piston unit back to said retracted position, said drive means comprising suction-generating means connected to said port and operative when activated for establishing subambient pressure in said second space, whereby said piston unit moves from said retracted to said non-retracted position upon the establishment of such subambient pressure as a result of the initial difference in pressures upstream and downstream of said first space, and whereby said piston unit returns to said retracted position due to the pressure equalization resulting when the sheet engaged and held by said sheet-engaging portion blocks further entrance of ambient air into said suction opening of said sheet-engaging portion, the hollow interior of said piston unit and the part of the hollow interior of said cylinder external to said piston unit together forming when said suction opening is blocked by a sheet and said piston unit is in the retracted position a closed chamber sealed off from the ambient atmosphere to such an extent that the subambient pressure established in such a chamber by said suction-generating means maintains said piston unit in the retracted position indefinitely until said suction-generating means is deactivated.

3,921,972

SHEET STACK RECEPTACLE

Laurence G. Miller, Drybrook, England, assignor to Rank Xerox Ltd., London, England

Filed Nov. 19, 1973, Ser. No. 417,023
Claims priority, application United Kingdom, Dec. 1, 1972, 55725/72
Int. Cl.² B65H *1/00*
U.S. Cl. 271—171 **4 Claims**



1. A receptacle comprising a base for supporting a stack of sheets, an edge margin guide disposed perpendicular to the base for abutting a side of the stack, the guide being mounted so as to be movable relative to the base to accommodate stacks of different dimensions, a longitudinal bar disposed below the base and formed around an axis which is parallel to the direction of movement of the guide, the bar being mounted to rotate around the axis and having a plurality of recesses formed in the surface of the bar which are perpendicular to and spaced along the axis, each recess having an end which merges into the surface of the bar, and a lug mounted for movement with the edge margin guide and biased into engagement with the bar over the range of positions of the edge margin guide relative to the base, the lug being adapted to engage a selected one of the recesses to retain the guide in a desired position, whereby the guide can be moved from one desired position to another desired position by rotating the bar so that the lug passes through the merging end of a first selected recess and out of engagement with the recess, moving the guide and lug along the axis of the bar to a position opposite a second selected recess, and rotating the bar so that the lug passes through the merging end of the second selected recess and into engagement therewith.

3,921,973

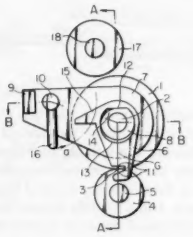
APPARATUS FOR SEPARATING SUPERIMPOSED FLEXIBLE SHEET MATERIALS

Takaich Kitagawa, Ibaraki; Yoshitaka Miyoshi, Nara; Takaji Washio, Toyonaka, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Continuation of Ser. No. 220,302, Jan. 24, 1972, abandoned. This application June 7, 1974, Ser. No. 477,454
Claims priority, application Japan, Jan. 27, 1971, 46-2445
Int. Cl.² B65H *29/64*
U.S. Cl. 271—172 **22 Claims**

1. Apparatus for separating superimposed sheet materials comprising a first segmenet roller formed of spaced segments fixed to a rotating shaft; a second segment roller disposed to form a nip position with said first segment roller to receive said sheet materials and rotating at a peripheral speed slower than the peripheral speed of rotation of said first segment

roller; and at least one separating member, said separating member having mounting means including a hole for loosely and rotatably mounting said separating member on said shaft of the first segment roller on the space between said segments to rotate independently of the rotation of said shaft; said loose mounting means including means for causing said separating member to move radially with respect to said shaft, said separating member having an engaging portion positionable at said



nip position for receiving the leading edges of the sheet materials and movable along the periphery of said first segment roller with engagement by the leading edges of the sheet materials, such that the sheet material contacting said second segment roller is shifted behind the sheet material contacting said first segment roller to gradually remove the leading edge of the sheet material contacting said second segment roller from said engaging portion of said separating member whereby the sheet materials are separated.

3,921,974

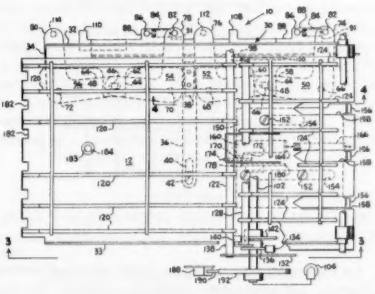
SHEET ORIENTING APPARATUS

Joseph F. Miciukiewicz, Trumbull, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 413,836, Nov. 8, 1973, Pat. No. 3,877,696. This application Oct. 3, 1974, Ser. No. 511,558

Int. Cl.² B65H *9/10*

U.S. Cl. 271—240 **4 Claims**



1. A sheet orienting device for establishing a predetermined position of a sheet having a predetermined width and consisting of a relatively soft and limp material, said device comprising:

A. an elongate relatively flat sheet supporting member having a fixed side edge guide extending along one longitudinal edge of said supporting member,

B. sheet pushing means extending along the opposite longitudinal edge of said supporting member and normally spaced laterally of said supporting member from said fixed guide by a distance greater than the width of a sheet to be oriented,

C. means mounting said sheet pushing means for limited movement toward and away from said fixed guide, the innermost limit of movement of said pushing means toward said fixed guide being a distance slightly less than the predetermined width of the sheet to be oriented, and

D. actuating means for moving said pushing means toward said fixed guide from said normally spaced position to said innermost position and then back to a position where said pushing means is spaced from said fixed guide by a distance substantially equal to the predetermined width of the sheet, whereby a sheet placed on said supporting member is moved toward said fixed guide and is slightly buckled longitudinally to assure proper alignment of the edge of the sheet with said fixed guide and is then allowed to flatten on the sheet supporting means by said movement of said pushing means away from said fixed guide to said position where its distance from said fixed guide is substantially equal to the predetermined width of the sheet, after which said fixed guide and said pushing means define a channel for guiding the sheet during longitudinal movement thereof.

3,921,975

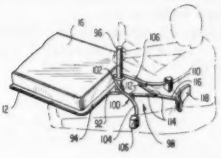
LEG MUSCLE EXERCISE APPARATUS

Robert H. Pridgen, 1714 Summit Place N.W., Washington, D.C. 20009

Division of Ser. No. 396,335, Oct. 11, 1973, Pat. No. 3,863,894. This application Sept. 6, 1974, Ser. No. 503,994

Int. Cl.² A63B *21/32*

U.S. Cl. 272—83 R **4 Claims**



1. A leg muscle exercising apparatus comprising, in combination, a pair of elongated bars joining together at one end in a generally V-shaped configuration, resilient spring means urging said bars away from one another, a pair of leg-engaging members mounted one on each said bar adjacent the free ends thereof in opposed relation to one another and in position to engage the opposed inner portions of a user's legs when in a sitting position and having his out-stretched legs spread wide apart, said leg-engaging members being adapted to be pushed toward one another by the force of the user's legs against the resilient force of said spring and to resiliently urge said user's legs back to their wide spread position, and an articulated lever mechanism operable by the user for selectively increasing the resistance of said spring, said lever mechanism including arm means engaging each of said opposed bars intermediate their respective ends, and actuating means engaging the user's torso and operably connected with said arm means for applying an outward force to said bars to thereby increase the resistance to defection thereof toward one another.

3,921,976

BATTING PRACTICE DEVICE

Charlie W. Lane, 525 E. Bonanza Road, Las Vegas, Nev. 89101

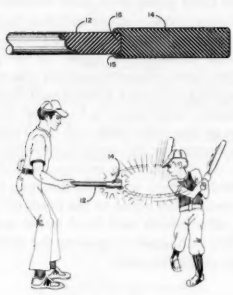
Continuation of Ser. No. 358,616, May 9, 1973, abandoned. This application Aug. 7, 1974, Ser. No. 495,398

Int. Cl.² A63B *69/40*

U.S. Cl. 273—26 R **7 Claims**

1. A batting aid device for being hit by a baseball bat for batting practice comprising an elongated handle for being

manually held and a resilient head member for being hit by a batting implement, both said handle and head member being solid and formed of an elastomeric material, said head member having a Durometer Shore Hardness of between 50 and 70 and said handle member having a Durometer Shore Hardness of between 70 and 90 and wherein the hardness of said handle is greater than the hardness of said head member.



3,921,977

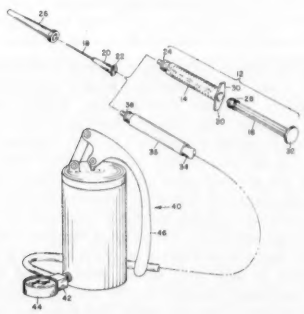
TENNIS BALL SEALING AND INFLATION MEANS

Jack Brink, San Antonio, Tex., assignor to All American Maintenance, Inc., San Antonio, Tex.

Filed Apr. 22, 1974, Ser. No. 462,946

Int. Cl.² A63B *41/12*

U.S. Cl. 273—61 D **6 Claims**



1. An apparatus for sealing and reinflating a dead ball, said apparatus comprises:

a sealant;

a hollow needle having a sharpened end for penetrating the wall of said ball;

means detachably connectable to said needle for injecting said sealant through said hollow needle into said ball;

a source of pressurized air;

a conduit having one end thereto connected to said source of pressurized air;

means for detachably connecting the other end of said conduit to said hollow needle after said injecting means has been detached therefrom so that said ball may be pressurized by said source of pressurized air through said hollow needle after said sealant has been injected into said ball.

3,921,978

GAME BAT

John E. C. Warren, 509 Riverside Drive, Melbourne Beach, Fla. 32951

Filed Oct. 18, 1973, Ser. No. 407,518

Int. Cl.² A63B *59/00*

U.S. Cl. 273—67 R **10 Claims**

1. A lightweight injury-free player's stick for a game comprising a solid substantially cylindrical resilient foam ball striking body having a length about 3 times the diameter, said ball striking body having a protective and frictional skin on the external surface thereof and a central longitudinal bore about 6 inches in depth, and a flexible handle means in said bore and extending a substantial distance therefrom.

3,921,979

INTERMEDIATE MEMBERS FOR THE CROSSING POINTS OF TENNIS RACKET STRINGINGS

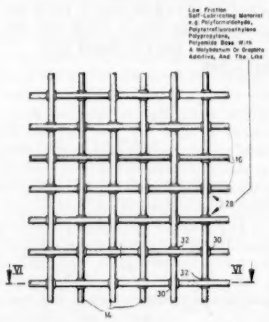
Gebhard Dischinger, Bremen, Germany, assignor to Babolat-Maillot-Witt, Lyon, France

Filed Nov. 30, 1973, Ser. No. 420,520

Claims priority, application Germany, Dec. 1, 1972, 2258872

Int. Cl.² A63B *51/00*

U.S. Cl. 273—73 R **14 Claims**



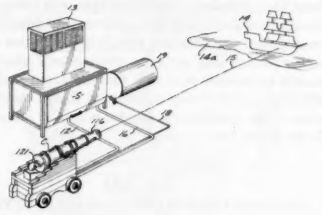
1. An intermediate crosspiece guide member formed of a low-friction self-lubricating synthetic material for use in a tennis racket stringing having crossing gutstrings, said member adapted to be mounted intermediate the gutstrings at the crossings thereof, said member comprising first and second recessed portions on opposite sides thereof, said recessed portions each including groove-forming pairs of upstanding wings adapted to extend along and engage at least part of the outer surface of gutstrings adapted to be received in said recessed portions, the groove-forming wings of said first recessed portion extending in a parallel spaced plane and transversely of the groove-forming wings of said second recessed portion adapted to prevent contact between adjacent gutstrings at the crossing thereof and to concurrently guide said gutstrings in coplanar and transverse directions.

3,921,980

ICE CANNON COMBINED WITH FROZEN PROJECTILE SUPPLY STRUCTURE AND TARGET STRUCTURE

Richard F. Artzer, Orange, Calif., assignor to Walt Disney Productions, Burbank, Calif.

Filed Aug. 5, 1974, Ser. No. 494,723
Int. Cl.² A63B *65/12*; F41F *1/04*; F41J *9/04*
U.S. Cl. 273—101 **10 Claims**



1. A target shooting apparatus comprising:
a shooting station;
a target station positioned down range therefrom and having target means within the range of projectiles launched from said shooting station;
a frozen projectile supply means remote from said shooting station having refrigeration means for the freezing of an aqueous medium into a plurality of solid-form frozen projectiles;
frozen projectiles storage means communicating with said frozen projectile supply means for storing frozen projectiles supplied thereby;
frozen projectile transport means for delivering frozen projectiles singly to said shooting station;
dispensing means to discharge said frozen projectiles, singly, into said transport means from said storage means;
cold chest means surrounding said storage means and said dispensing means; and
projectile launching means at said shooting station including means communicating with said transport means to receive said frozen projectiles singly from said transport means and to place each of said projectiles into a location in said launching means from which it is to be launched, said projectile launching means further including means to direct said launching means towards said target means and to discharge said projectiles from said launching means in a controlled trajectory at said target means.

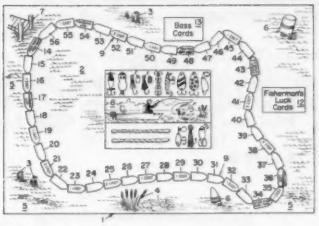
3,921,981

BASS TOURNAMENT FISHING BOARD GAME

William A. Ashburn, 4315 15th Ave., Chattanooga, Tenn. 37407

Filed Apr. 29, 1974, Ser. No. 464,832
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 CB **2 Claims**

1. A board fishing game comprising a board representing a lake having a continuous peripheral series of representations of a boat showing sequential positions of the boat and bearing indicia designating actions to take when a token lands on certain representations, and a center panel representing a tackle box containing representations of different lures, a plurality of identifying tokens, one representing each player, a die showing how many spaces to move the token, a plurality of "fisherman's luck" cards showing what game related action a player should take, and a plurality of "bass" cards showing pictures of lures corresponding to those in the tackle box, each bass card having on it a representation of a fish and its weight, certain of said indicia directing the player to make a simulated cast by selecting one of said lure representations,



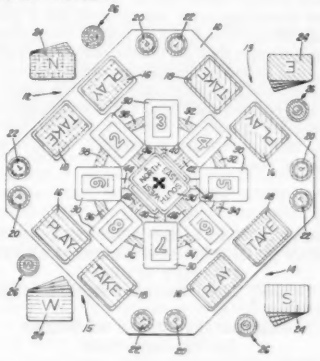
the player keeping the card as his catch if the selected lure matches the lure on the "bass" card.

3,921,982

BOARD GAME APPARATUS

Marshall H. Feldman, P.O. Box 922, Twenty-nine Palms, Calif. 92227

Filed July 1, 1974, Ser. No. 484,865
Int. Cl.² A63F *3/00*
U.S. Cl. 273—135 AC **4 Claims**



1. A game to be played by two to four players, comprising, in combination:
a game having a playing field comprising an even-numbered plurality of sequentially-numbered outer playing stations spaced apart from one another and arranged in the form of a closed loop, plus a central playing station;
a plurality of pairs of peripheral colored bars connecting said outer playing stations together in groups of three adjoining stations, each group of three being connected by two bars of the same distinctive color, and the pairs of connecting bars joining other groups of three being of different distinctive colors;
another plurality of pairs of radial colored bars connecting said central playing station to pairs of diametrically opposite outer playing stations, each pair of radially extending bars on opposite sides of said central playing station having distinctive colors different from the colors of the other pairs of radial bars;
a set of chips for each player, each chip having indicia on one face only to identify the player to whom it belongs, said chips being placed face-down on selected stations by the players at the start of the game, so that the ownership of the chip is concealed; and
a plurality of decks of playing cards, one deck for each player, said cards being played successively by the players

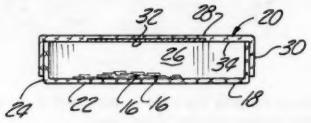
on said playing stations to build a 2-card or a 3-card winning combination on two or three adjoining playing stations that are interconnected by peripheral or radial bars of the same color.

3,921,983

GAME DISCS AND STORAGE BOX THEREFOR

Howard J. Taylor, 1412 Blackberry Lane, Flint, Mich. 48507

Filed June 24, 1974, Ser. No. 482,419
Int. Cl.² A63F 3/06
U.S. Cl. 273—148 R **2 Claims**



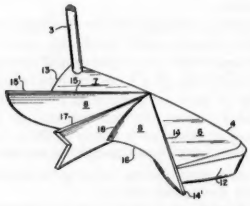
1. In a game of chance of the type employing a game card having a playing space thereon and wherein markers are placeable on such space, the improvement which comprises: a storage box for the markers, the storage box comprising:
   a. a bottom portion having a base support and an upstanding wall integrally formed therewith,
   b. a lid portion commensurate in size with the game card and comprising a top support wall and a downwardly depending sidewall, the lid portion being dimensioned slightly larger than the bottom portion such that the lid portion slidingly receives the bottom portion,
   c. a magnetic plate embedded in the top support wall of the lid portion, and having a dimension equal to at least twice the diameter of any single marker, and
   wherein the markers are magnetically attractable by the magnetic plate.

3,921,984

CLUBHEAD HAVING ALIGNMENT MEANS AND HIGH MOMENT OF INERTIA SPACED FROM CENTER OF GRAVITY THEREOF

Lloyd C. Winter, 1430 Cherrydale Drive, San Jose, Calif. 95125

Filed Nov. 1, 1972, Ser. No. 302,893
Int. Cl.² A63B 53/04
U.S. Cl. 273—164 **6 Claims**



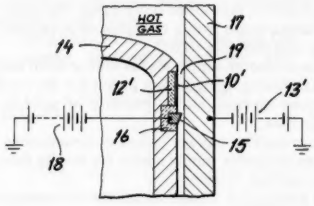
1. A golf club comprising:
   a. a clubhead having a body including top and bottom surfaces, a front face, a rear face spaced from said front face, and end edges connecting said front face to said rear face, the spacing between the front and rear faces of the body adjacent said end edges being substantially greater than the front to rear face spacing at a point approximately midway between said end edges, the length of said front face being substantially larger than the depth of said clubhead measured between the front face and the rearmost portion of the clubhead;
   b. shank means anchored in said clubhead adjacent one of said end edges and constituting a handle for said golf club; and
   c. a pointer on said clubhead converging from said rear face of the body toward said front face, the apex of said pointer being coincident with said front face and said top surface and designating the midpoint of said front face measured between said end edges;
   d. said pointer extending from said front face rearwardly to at least said rear face to designate the midpoint of said front face between said end edges and flange means on the clubhead adjacent said pointer and equally divergent on opposite sides thereof from said midpoint of the front face and defining an apex thereat and extending rearwardly to at least said rear face adjacent said end edges whereby a golfer may utilize said flange means to determine if the clubhead is square with the intended line of flight of the ball.

3,921,985

CONTACTLESS FLOW-GUIDANCE SYSTEM

Hans Fimml, Klausenerstrasse 4, A-6020 Innsbruck, Austria

Filed Jan. 4, 1974, Ser. No. 430,878
Claims priority, application Austria, Jan. 5, 1973, 8984/73
Int. Cl.² F16J 15/00
U.S. Cl. 277—22 **6 Claims**



1. A contactless seal between a piston member and a cylinder member having confronting surfaces closely spaced from each other by a narrow peripheral gap, said cylinder member forming a chamber for a fluid to be confined, said seal comprising a thermionic coating on the confronting surface of one of said members, heating means for raising the temperature of said coating to an electron-emissive level, and biasing means for maintaining the region of said gap at a potential more negative than that of a part of said chamber remote from said gap for repelling said fluid upon ionization thereof by the emitted electrons.

3,921,986

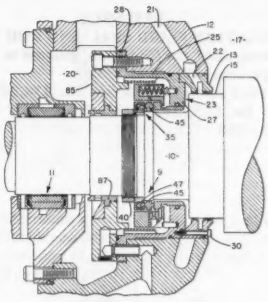
SHAFT SEAL

Carl H. Geary, Greensburg, and Owen S. Taylor, Jeannette, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 336,865, Feb. 28, 1973, abandoned. This application July 10, 1974, Ser. No. 487,108
Int. Cl.² F16J 15/34
U.S. Cl. 277—83 **3 Claims**

1. In a shaft seal assembly having an annular member affixed to the shaft for rotation therewith, a sleeve encompassing the shaft and being biased axially towards said annular member and a free-floating sealing ring interposed between the annular member and the sleeve to prevent a pressurized working substance from leaking about said shaft, the improvement comprising
   a contact ring mounted within an annular recess formed in the rotating annular member and having a substantially radial sealing surface arranged to ride in face-to-face contact with a coacting surface on the sealing ring,
   at least one annular sealing gasket formed of a resilient material mounted within a circumferential groove formed

in the contact ring and being arranged to seat against the rear wall and one side wall of the recess formed in the annular member for maintaining said face-to-face contact between the contact ring and the sealing ring independent of the position of the annular member,



at least one aperture passing through the rear wall of said annular member and said contact ring to define a flow path over which cooling fluid in capable of moving into contact with said free-floating sealing ring, and

means for bringing a cooling fluid to said aperture whereby the cooling fluid is pumped through said flow path under the influence of the rotating annular member into contact with the free-floating sealing bushing.

3,921,987

SHAFT SEALS

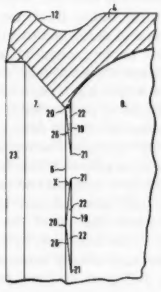
David Ernest Johnston, Newcastle-upon-Tyne, and Peter John Russell, Morpeth, both of England, assignors to George Angus & Company Limited, England

Filed June 18, 1973, Ser. No. 370,775

Claims priority, application United Kingdom, June 29, 1972, 30418/72

Int. Cl.² F16J *15/32, 15/48*

U.S. Cl. 277—134 **11 Claims**



1. A rotary shaft lip seal comprising a moulded ring of elastomeric material with a sealing lip having a sealing edge defined by a moulded face, on the air side of the seal, moulded with positive action ridges having an even number of vane surfaces obliquely meeting the sealing edge in opposite circumferential directions at a small angle, said moulded face being concave so as to meet the sealing edge at a sharply defined angle and said ridges, at the ends thereof further from said sealing edges being merged smoothly into the curvature of the arcuate concavity of the moulded face.

3,921,988

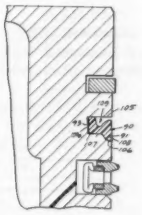
PISTON AND RESILIENT PLASTIC PISTON RING COMBINATION

Herbert F. Prasse, and Harold E. McCormick, both of Ballwin, Mo., assignors to Ramsey Corporation (TRW Inc.), Cleveland, Ohio

Division of Ser. No. 134,985, April 19, 1971, which is a division of Ser. No. 16,278, March 4, 1971, Pat. No. 3,608,911. This application Sept. 17, 1973, Ser. No. 398,192

Int. Cl.² F16J *9/00*

U.S. Cl. 277—168 **8 Claims**



1. In combination with a piston received in a piston cylinder, the piston having a ring-receiving groove with a stepped bottom radial wall:

a ring of resilient plastic material having inner and outer diameters and an axial thickness;

an axially extending groove projecting into said ring from the axial end thereof intermediate the inner and outer diameters and said axially extending groove dividing said ring into radially inner and radially outer portions integrally connected through a central portion at the bottom of the axially extending groove;

one axial end of the radially inner portion adjacent to said axially extending groove extending axially beyond the corresponding end of the radially outer portion;

the other axial end of the radially outer portion extending beyond the corresponding end of the radially inner portion;

and the bottom of said plastic ring received in the stepped bottom of the ring-receiving groove with said other axial end of the radially outer portion received in the stepped portion of the ring-receiving groove;

portions of said other axial end extending radially beyond said piston and contacting the wall of said cylinder.

3,921,989

NON-BINDING SHAFT SEAL ASSEMBLY FOR LIQUID FLOW DETECTORS

David M. Ward, La Jolla, Calif., assignor to Potter Electric Signal Co., St. Louis, Mo.

Filed Feb. 1, 1974, Ser. No. 438,734

Int. Cl.² F16J *9/00*

U.S. Cl. 277—173 **5 Claims**

1. For use in a liquid flow detector of the type including a casing securable to a flow pipe and having a vane positioned therein on the inner end of a shaft extending outward through the pipe and through a forward bore opening of a casing, forwardly of which the shaft is pivoted, the casing having an inner flat forward face formed about such bore opening,

the invention comprising the combination of

A. an annular seal-retaining groove in the casing at the periphery of such inner forward face,

B. a shaft seal integrally molded of elastic, rubber-like material and having

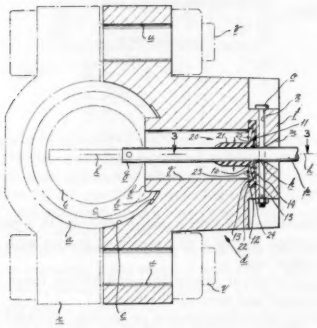
an outer ring-like compressible flange positioned within said seal-retaining groove and whose uncompressed thickness so exceeds the width of said seal-retaining groove as the require greater than atmo-

spheric pressure to compress and insert it within the groove,

a central inward-extending hub portion having a central bore fitted onto such shaft, said bore being sized to fit onto such shaft with an inwardgrasping pressure less than atmospheric pressure, the seal being otherwise free of retention, and

an intermediate membrane portion whose thickness lessens from the hub portion to the flange portion, said central and intermediate portions having together a forward surface, and

C. a rigid washer on the shaft positioned between said seal forward surface and the inner forward face of such



casing, the washer outer diameter being smaller than said seal forward surface and its inner diameter being smaller than such casing bore opening,

whereby, on removal of pressure within the casing, the washer will be displaced aft, and the excess of external atmospheric pressure exerted at and through the said bore opening will cause the said membrane to bow inwardly, exert tension on the thicker membrane portion adjacent to the hub, and distend the hub, thereby to blow atmospheric air inward around the shaft while leaving the flange portion undisturbed and retained by its superatmospheric compression within the retaining groove.

3,921,990

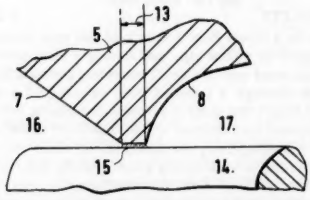
SHAFT SEALS

David Ernest Johnston, Newcastle-upon-Tyne, and Peter John Russell, Northumberland, both of England, assignors to George Angus & Company Limited, England

Filed June 18, 1973, Ser. No. 370,730

Int. Cl.² F16J *15/00*

U.S. Cl. 277—182 **4 Claims**



1. A rotary shaft lip seal comprising a moulded ring of elastomeric material with a sealing lip having a sealing edge defined on the air side by a concave moulded face, in which the elastomeric material of the ring has a Young's modulus of a value between 3.5 and 8.5 MN/m² and the concavity of the moulded face is such that it meets the sealing edge at a tangent angle of between 50° and 80° inclusive, the resultant effect of the resilient characteristics of the material having a said value of Young's modulus and the moulded face a said tangent angle being that, in use, the moulded face sharply meets and maintains defintion of a sealing wear band.

3,921,991

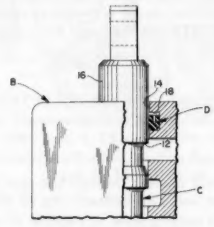
COMBINATION FLUID SEAL AND ROD WIPER

Gerald H. Beck, Salt Lake City, Utah, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jan. 17, 1974, Ser. No. 434,299

Int. Cl.² F16J *15/32*; **F16K** *41/04*

U.S. Cl. 277—205 **7 Claims**



5. In a device having a fluid chamber and a bore communicating said chamber with the exterior of said device, a rod reciprocatingly received in said bore and extending externally through said bore, an annular packing chamber in said bore surrounding said rod, said packing chamber being defined by a circumferential groove in said bore, said packing chamber having radially-spaced cylindrical side walls defined by the bottom of said groove and the outer surface of said rod, said packing chamber having axially-spaced end walls defined by the ends of said groove, a ring of elastomeric material positioned in said packing chamber and having a seal portion radially squeezed between said side walls adjacent the axially inner chamber end wall, said seal portion having a rounded end surface to provide sealing characteristics similar to an O-ring and being positioned with said rounded end surface facing said fluid chamber and directly exposed to fluid therein from between said bore and said rod, and a pair of wiper tails of substantially uniform radial thickness initially diverging from said seal portion and deformed to substantially cylindrical form between said packing chamber side walls for yieldable engagement therewith; said tails defining an annular groove therebetween which has a bottom axially beyond the center line of said rounded end surface; said wiper tails extending toward the exterior of said device and terminating in blunt annular ends substantially coextensive with the radial thickness of the respective tails and lying in a plane perpendicular to the axis of said bore and rod and parallel to the axially outer chamber end wall; each of said tails being of radial thickness nearly one-half the radial thickness of said seal portion effectively to resist distortion by axial compression of said blunt ends against such axially outer chamber end wall by fluid under pressure acting on said seal portion.

3,921,992

SEALS NOTABLY FOR ROTARY SHAFTS

Jacques Bertin, Asnieres, France, assignor to Paulstra, Levallois Perret, France

Filed Dec. 5, 1974, Ser. No. 529,725

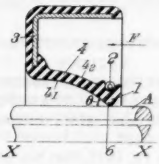
Claims priority, application France, Dec. 21, 1973, 73.46114

Int. Cl.² F16J *15/32*

U.S. Cl. 277—237 **5 Claims**

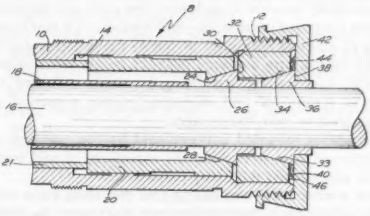
1. Seal, notably for a rotary shaft, said seal comprising a diaphragm of elastomer in the shape of a portion of a cupola

or the like, connected through its large base to a rigid armature and ending, on the side of its small base, in at least one sealing lip designed to come into contact with the shaft or the like, the profile of the concavity of the inner face of the cupola



being kept continuous up to the contact edge of the lip so that the angle of incidence of the inner profile with the axis of the shaft, at the location of said edge, has a value, at least before mounting, of at least 35°.

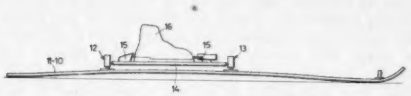
3,921,993
COLLET CHUCKING ASSEMBLY
John Milton Ingham, North Kingstown, and Lloyd Frederick Reslow, East Greenwich, both of R.I., assignors to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.
Filed Aug. 31, 1972, Ser. No. 285,214
Int. Cl.² B23B *31/20*
U.S. Cl. 279—50 **8 Claims**



1. A collet chucking assembly comprising a tubular spindle, a rear chuck sleeve slidably positioned within the spindle, a rear collet having a tapered external surface thereon and an abutment portion, said rear chuck sleeve having a mating tapered surface, a front chuck sleeve having a tapered surface thereon and a front collet having a tapered surface thereon, said front chuck sleeve engaging said abutment portion of said rear collet, means retaining said front collet within said spindle whereby when said rear chuck sleeve is moved axially into engagement with said rear collet force is transmitted through the front chuck sleeve to the front collet to close both collets about a work piece.

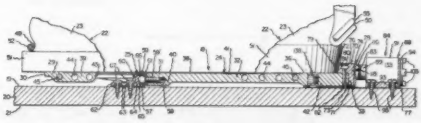
3,921,994
SPLIT-STRUCTURE SKIS
Giuseppe Locati, Via S. Andrea 7, Monza (Milan), Italy
Filed May 2, 1974, Ser. No. 466,469
Claims priority, application Italy, May 2, 1973, 23631/73
Int. Cl.² A63C *5/00*
U.S. Cl. 280—11.13 W **6 Claims**

1. A ski comprising a binding portion, to which a ski boot of a skier is intended to be fastened, and a sliding body provided with at least one longitudinal slot which at least partially divides it into two side-by-side runners, linkage means for individually connecting each runner to said binding portion in such manner as to allow said runners to move with respect to



each other perpendicularly to the sliding plane of the sliding body.

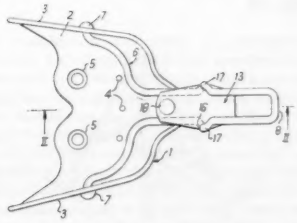
3,921,995
SKI BINDING
William C. Moog, East Aurora, N.Y., and Alfred J. Mastropole, Saddle River, N.J., assignors to Moog Inc., East Aurora, N.Y.
Filed May 3, 1974, Ser. No. 466,528
Int. Cl.² A63C *9/086*
U.S. Cl. 280—11.35 K **21 Claims**



1. A ski binding for releasably securing a boot assembly to a ski, wherein the improvement comprises:

resiliently-loaded holding means operatively interposed between said ski and boot assembly for releasably holding said boot assembly in a suspended position above said ski in spaced relation thereto and for permitting said boot assembly to separate from said ski in any direction away from said ski, said holding means providing the only support for said boot assembly on said ski and including at each of only three mutually-spaced locations arranged at the apices of an imaginary triangle a concave surface on one of said boot assembly and ski and a convex surface on the other of said boot assembly and ski and contacting said concave surface.

3,921,996
SKI BINDING WITH CLAMPING BAIL
Bror With, Jarlsborgveien 1, Oslo, Norway
Filed June 26, 1974, Ser. No. 483,368
Claims priority, application Norway, July 2, 1973, 2704/73
Int. Cl.² A63C *9/00*
U.S. Cl. 280—11.35 B **3 Claims**



1. An improvement in a ski binding of the toe binding type for properly positioning a boot, said ski binding comprising a toe iron having upstanding toe iron lugs, a clamping bail having a pair of rear leg portions shaped to engage the sole rim of a boot about its toe portion with the rearward end of said rear leg portions pivotally mounted on said lugs, a keeper means fixedly disposed forwardly of said toe portion, said

clamping bail having a pair of forward leg portions terminating into a forward bight portion; said improvement comprising a latching lever pivotally supported at its mid-section by said forward leg portions, said lever having a forward arm portion projecting downwardly toward and forwardly of said keeper means and having a rearward arm portion which is accessible from above, said forward leg portions being formed with oppositely directed angular sections that laterally engage said latching lever mid-section to provide a spring-load on said lever in the transverse direction; and hook means for releasably connecting said forward arm portion to said keeper means.

3,921,997

SKI BINDING ADJUSTMENT DEVICE

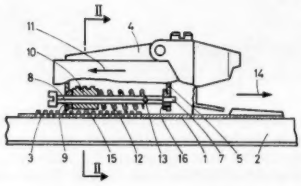
Jean-Marie Begey, and Alain Neau, both of Cluses, France, assignors to Mitchell S.A., France

Filed Nov. 11, 1974, Ser. No. 522,869

Claims priority, application France, Nov. 16, 1973, 73.40980

Int. Cl.² A63C *9/08*

U.S. Cl. 280—11.35 T **4 Claims**



1. An adjustment device for a ski binding, comprising; a slide structure fixed longitudinally on a ski; a binding structure on the slide structure; and means for approximately and for finely adjusting positions of the binding structure on the slide structure, said adjusting means comprising a rack cooperating with a worm screw both disposed axially to the ski, the rack being fixed axially on one of said structures and the screw being fixed axially on the other structure, the screw including an interruption of its thread extending along its entire length to enable disengagement of the screw from the rack.

3,921,998

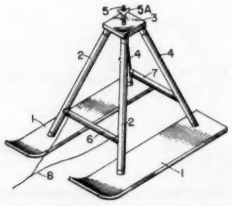
AUXILIARY ATTACHMENT FOR SNOWMOBILES

Stanley A. Broughton, Rte. 13, Box 643A, and Dennis K. Guenther, 5820 Estero Blvd., both of Fort Meyer Beach, Fla. 33931

Filed Oct. 23, 1973, Ser. No. 408,323

Int. Cl.² B62B *15/00*

U.S. Cl. 280—19 **3 Claims**



1. An auxiliary attachment to enable the towing of disabled snowmobiles comprising a pair of parallel skis to which are removably attached four upwardly extending structural members, one of said structural members attached to the rear of each ski and one of said structural members attached to the front of each ski, a weight-bearing member removably attached to the upper ends of said structural members, a bolt with locking means extending upwardly through said weight-bearing member, rear brace member removably attached between the lower portions of the two rear structural members, front brace member removably attached between the lower portions of the two front structural members, a flexible and removably attached to the center of the front brace member.

3,921,999

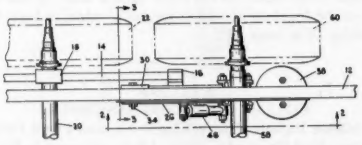
VEHICLE SUSPENSION CONSTRUCTION AND SUB-ASSEMBLY THEREFOR

Lloyd D. Masser, Muskegon, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed June 12, 1973, Ser. No. 369,132

Int. Cl.² B60G *5/00*

U.S. Cl. 280—104.5 R **12 Claims**



1. In a recreational vehicle suspension system wherein the vehicle has a frame beam, a leaf spring is operably mounted to said frame beam, and a first axle is mounted to said leaf spring; the improvement which comprises:

a mounting plate secured to said frame beam in overlapping relationship with said leaf spring;

a rigid trailing arm;

means rigidly secured to said mounting plate and depending from a forward portion thereof forwardly of a rear mounting of said leaf spring for pivotably mounting one end of said trailing arm a spaced distance below said mounting plate, said trailing arm being pivotably mounted to a lower portion of said mounting means; a second axle mounted on said trailing arm;

an air spring mounted between said trailing arm and said mounting plate to cushion the movement of said trailing arm toward said mounting plate; and

means connected at one end to said mounting plate and at the other end to said trailing arm to dampen the oscillation of said trailing arm with respect to said mounting plate.

3,922,000

LIQUID-COMPRESSION SUSPENSIONS FOR AUTOMOBILE VEHICLES

Francois C. Pruvot, and Michel Fayolle, both of Billancourt (Hauts de Seine), France, assignors to Regie Nationale des Usines Renault, Billancourt (Hauts de Seine) and Automobiles Peugeot, Paris, both of, France

Filed Mar. 19, 1973, Ser. No. 342,504

Claims priority, application France, Mar. 24, 1972, 72.10451

Int. Cl.² B60G *3/14*

U.S. Cl. 280—124 F **16 Claims**

1. In an automotive vehicle having an engine, a chassis supporting the engine and wheels supporting the chassis, a suspension system comprising:

at least one movable suspension arm per wheel coupling that wheel to said vehicle chassis;

a pivot shaft coupled to and rotatably driven by said suspension arm;

a compressor having a sealed casing fixed with respect to said chassis and having a fluid-tight seal through which said pivot shaft traverses into said casing and further including

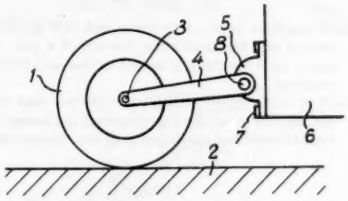
a beam located in said casing and coupled to and rotatable with said pivot shaft,

two symmetrically disposed piston-cylinder units located in said casing, each unit comprising a cylinder, a piston movable in said cylinder, and a piston chamber defined between the piston and cylinder, the pistons engaging and being driven by opposite end portions of said beam for movement in opposite directions relative to each other;

a first closed tank containing a first compressible fluid under pressure;

a second tank containing a second fluid under lower pressure than the fluid in said first tank;

fluid circuit means coupling said piston chambers to each other and said second fluid in said second tank to said



piston chambers, said fluid circuit means also communicating with the fluid in said first tank;

means communicating the fluid in said second tank with the interior of said sealed casing;

valve means interposed in said fluid circuit means and coupled to said engine to control the flow of fluid through said fluid circuit means in response to a predetermined engine operating characteristic;

pump means interposed in said fluid circuit means between said second tank and said piston-chambers to pump fluid under pressure from said second tank to said chambers; and

sensing means couped to said pump means to control the operation of said pump means as a function of the position of said vehicle relative to the ground.

3,922,001

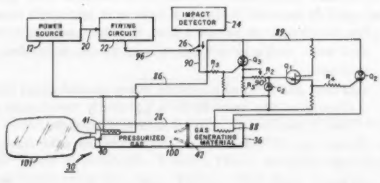
INFLATION TIME CONTROL FOR SAFETY DEVICE

Donald J. Lewis, Troy, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 27, 1971, Ser. No. 192,850

Int. Cl.² B60R *21/08*

U.S. Cl. 280—150 AB **22 Claims**



1. A vehicle occupant restraint system comprising, in combination, source means actuatable to provide first and second volumes of pressure fluid, an occupant restraint cushion inflatable from said source means, control means for actuating said source means to release said first and second volumes of pressure fluid in response to an impact above a predetermined minimum intensity, said control means including time delay means to sequentially release said second volume of pressure fluid after said first volume of pressure fluid, whereby said first and second volumes are released either sequentially in response to lower levels of intensity above said predetermined minimum intensity or substantially simultaneously in response to a predetermined higher level of intensity above said lower levels of intensity.

2. Apparatus for transmitting an electrical current to a gas source disposed in a vehicle comprising:

a. a power source for supplying the current;

b. first circuit means for transmitting the current from the power source to a first portion of the gas source during a first time interval;

c. second circuit means for transmitting the current from the power source to a second portion of the gas source during a second time interval;

d. means for causing the current to pass through said first and second circuit means in a variable time differential upon impact of the vehicle dependent on the velocity of the vehicle.

3,922,002

OCCUPANT RESTRAINT SYSTEM

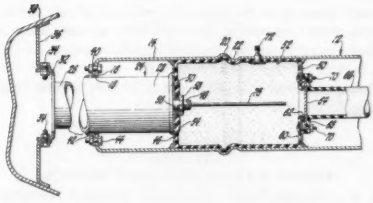
Brook A. Lindbert, Utica; Edward H. Mertz, Birmingham, and Wesley L. McCollum, Brighton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1972, Ser. No. 309,499

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B60R *21/08*

U.S. Cl. 280—150 AB **4 Claims**

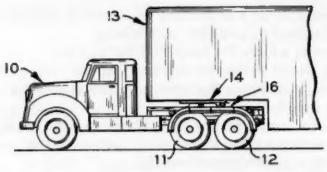


1. The combination comprising, an automotive vehicle having a frame including a controlled mechanically deformable frame portion for absorbing high range impact forces, an impact member, low range energy absorbing means mounting the impact member on the deformable portion of the frame, the frame portion remaining undeformed during absorption of low range impact forces by the energy absorbing means, the energy absorbing means transferring high range impact forces to the deformable portion of the frame to initiate deformation thereof and absorption of such high range forces, a self contained source of pressure fluid within the deformable portion of the frame, an inflatable occupant restraint, mechanically rupturable means normally blocking communication of the source with the restraint, and mechanical rupturing means operable by the low range energy absorbing means during mechanical deformation of the frame portion to rupture the rupturable means and establish communication of the source with the restraint to inflate the restraint.

3,922,003
SPRAY SHIELD FOR THE WHEELS OF A HIGHWAY VEHICLE

Harlan L. Lea, Largo, Fla., assignor to Lancaster Colony Corporation, Wapakoneta, Ohio

Filed Oct. 29, 1974, Ser. No. 518,483
Int. Cl.² B62D *25/16*
U.S. Cl. 280—154.5 R **4 Claims**



1. A spray shield for the wheels of a highway vehicle, said shield comprising, in combination,

a. two generally arcuately shaped main units, each adapted to be positioned selectively at the front or rear upper quadrant of a wheel,

b. at least one straight main unit adapted to be positioned horizontally above a wheel and to be connected to the upper ends of said arcuately shaped units, all of said units being fabricated from stiffly deformable material,

c. interengaging elements at the ends of all of said units for assembly of said units in end-to-end relationship,

d. generally arcuately shaped and straight shoulder portions at the outer edges of the similarly shaped ones of said main units and extending outwardly and downwardly relative to said main units,

e. interengaging elements at the ends of shoulder portions for assembly thereof in end-to-end relationship,

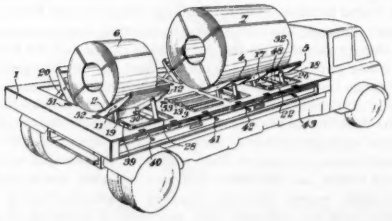
f. each of said interengaging elements consisting of a male protuberance at one end of each of said units and a female opening at the other end of each of said units, said protuberances having cross sections at their ends larger than the cross sections of said female openings for snap-in engagement there between, and

g. means for mounting said shield in overlapping relationship to the wheels to be shielded.

3,922,004
VEHICLE LOAD SECURING DEVICE

Bruce C. Chamberlain, Amersham, England, assignor to Winn-Boughton Limited, England

Filed Oct. 31, 1973, Ser. No. 411,194
Claims priority, application United Kingdom, Feb. 14, 1973, 7134/73
Int. Cl.² B60P *7/12*
U.S. Cl. 280—179 R **13 Claims**



1. A vehicle load securing device for use in the transport of cylindrical objects comprising a flat rectangular framework in which are mounted a plurality of pairs of pivotally-mounted platforms wherein:

said platforms are arranged so that each pair is individually moveable from a first position in which the two platforms of that pair are coplanar to a second position in which the two platforms are relatively inclined and between them provide a support for one of said cylindrical objects;

one platform in each pair is located on one side of the longitudinal axis of the framework while the other platform in each pair is located on the opposite side of said longitudinal axis;

the pivot axes of all the platforms on said one side of the longitudinal axis are coincident, and wherein the pivot axes of all the platforms on said opposite side of the longitudinal axis are also coincident;

said pivot axes are equally spaced from said longitudinal axis;

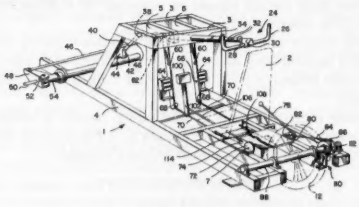
each platform is movable from said first position to said second position under the control of a pair of support arms, each pivotally attached at one end thereof to the platform; and

each of said support arms is pivotally attached at the other end thereof to an axle carrying tracking means running on tracks extending transversely of the framework.

3,922,005
OCCUPANT-PROPELLED VEHICLE AND DRIVE SYSTEM THEREFOR

Robert L. Bundschuh, West Simsbury, Conn., assignor to Mitsui Mining & Smelting Co., Ltd., Japan

Continuation-in-part of Ser. No. 183,147, Sept. 23, 1971, abandoned. This application Mar. 6, 1973, Ser. No. 338,641
Int. Cl.² B62M *1/04, 11/04*
U.S. Cl. 280—237 **9 Claims**



1. In an occupant-propelled vehicle, the combination of

a frame;

running gear carried by said frame and including at least one driven wheel;

a seat mounted on said frame and comprising

a generally horizontal seat portion, and

a back support extending upwardly from said seat portion;

two pedals located in front of said seat and each mounted for movement between a first position, which is nearer said seat, and a second position, which is further from said seat,

said first and second positions being spaced apart longitudinally of the vehicle in a generally horizontal plane which passes adjacent to said seat portion;

a change-speed transmission mounted on said frame and comprising

an input shaft,

an output shaft, and

gearing interconnecting said input and output shafts;

first motion transfer means interconnecting said output shaft of said transmission and said at least one driven wheel and comprising

first overrunning clutch means oriented to cause said first motion transfer means to rotate said at least one driven wheel only when said output shaft of said transmission

is turned in that direction which will cause said at least one driven wheel to move the vehicle forwardly;

second motion transfer means interconnecting said pedals and said input shaft of said transmission and comprising second overrunning clutch means oriented to rotate said input shaft in a direction to drive the vehicle forwardly when at least one of said pedals is moved from said first position toward said second position; and

constant force spring restoring means connected to return said pedals toward said first position.

3,922,006

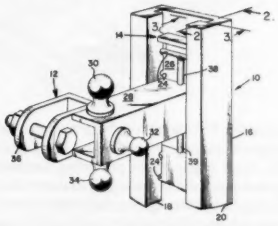
SELECTABLE AND HEIGHT ADJUSTABLE HITCH

Alfred Richard Borges, 25433 Feijoa, Lomita, Calif. 90717

Filed Oct. 15, 1974, Ser. No. 514,493

Int. Cl.² B60D *1/06*

U.S. Cl. 280—415 A **1 Claim**



1. An adjustable hitch comprising:

a supporting flat plate having an even number of opposing sides that is substantially symmetrical about the center of said plate,

a hitch supporting structure fixedly attached to the central portion of said flat plate and having opposing sides paralleled to the opposing sides on said flat plate,

a plurality of hitches each attached to one side of said hitch supporting member,

a plurality of keys one for each side symmetrically mounted on said flat plate perpendicular to a side of said hitch supporting structure,

a channeled bracket member for accepting said flat plate and adapted to be fixedly supported on a towing vehicle, said channel members having a pair of spaced apart shoulder members for accepting and limiting horizontal movement of said flat plate,

a plurality of keyways located on said spaced apart shoulder members for nesting with opposing keys on said flat plate, and

a removable wedge member located between said flat plate and said bracket member for maintaining said keys on said flat plate in said nesting position with said keyways on said channel members thereby preventing vertical or horizontal movement of said flat plate.

3,922,007

LATERALLY SHIFTABLE HITCH WITH OPTIONAL FREE MOVING COUPLER

Adolph Hans Friedebach, Toledo, Ohio, assignor to Keegan Steel Fabricating Co., Inc., Toledo, Ohio

Filed July 26, 1973, Ser. No. 382,840

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B60D *1/00*

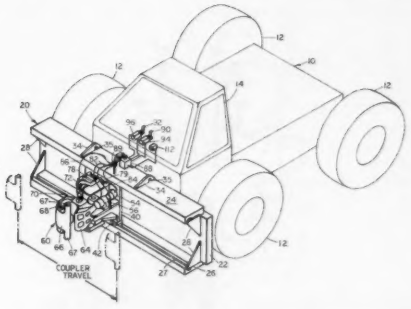
U.S. Cl. 280—456 R **9 Claims**

1. In a self-propelled vehicle having a railroad coupler mounted on a plate freely slidable in a horizontal track across one end of said vehicle, the improvement comprising:

A. rack means along said track,

B. pinion means mounted on said plate engageable with said rack means,

C. motor means for driving said pinion means to move said plate back and forth along said track, and



D. clutch means between said motor means and said pinion means for disconnecting said pinion means from said motor means when said motor means is not operating, whereby said plate is free to move along said track means.

3,922,008

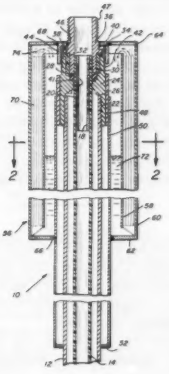
LIQUID COOLED METER RISER

Roy E. Stiner, and John David Johnston, both of Tulsa, Okla., assignors to Continental Industries, Inc., Tulsa, Okla.

Filed Aug. 26, 1974, Ser. No. 500,548

Int. Cl.² F16L *53/00*

U.S. Cl. 285—41 **6 Claims**

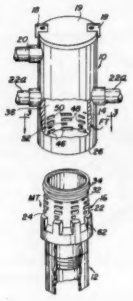


1. A liquid cooled meter riser comprising a substantially L-shaped metallic sheath member, plastic pipe means concentrically disposed within said sheath member and extending longitudinally therethrough for connection between a buried plastic pipe and a metallic meter coupling, means cooperating with the sheath member and plastic pipe means therein for connection of said plastic pipe means with said meter coupling, heat sink means secured around at least a portion of the sheath and plastic pipe means therein in the proximity of the connection thereof with the meter coupling, and liquid cooled insulator means disposed around at least a portion of the heat sink means for protection thereof from the environment thereabout.

3,922,009
COUPLING

Ben F. Giebeler, San Bernardino, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed July 5, 1974, Ser. No. 485,851
Int. Cl.² F16L 37/24
U.S. Cl. 285—87 14 Claims



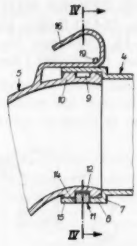
1. In a joint, the combination comprising:
a male cylindrical member;
a female cylindrical member;
said male member being insertable into the female member a predetermined distance;
a plurality of axially spaced and circumferentially interrupted threads on each member which mesh with one another upon rotation of one of said members to releasably couple said members together; and
circumferentially spaced stop lugs on each of said members which are circumferentially aligned with one another when said male member is at said predetermined distance in said female member to limit the rotation of said members relative to one another to a portion of a revolution equal in distance to the length of one of said threads, and to permit rotation of said members relative to the other in one direction only for coupling said members and in the opposite direction only for uncoupling said members; and wherein stop lugs on each of said members are threadedly engaged with the threads on the other of said members when said members are releasably coupled together to thereby augment the interengaged surface area of said members and thus the strength of the joint.

3,922,010
PIVOTABLE INTAKE TUBE FOR AIR FILTERS OF INTERNAL COMBUSTION ENGINES

Herbert Alf, Ludwigsburg, and Bernhard Behrendt, Abstatt, both of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Oct. 26, 1973, Ser. No. 409,913
Claims priority, application Germany, Oct. 27, 1972, 7239451
Int. Cl.² F16L 27/00
U.S. Cl. 285—179 7 Claims

1. In a pivotable intake tube for the air filter of an internal combustion engine, a rotary tube connection comprising in combination:
a first tube end portion having a substantially cylindrical female bearing portion;
a second tube end portion having a substantially cylindrical male bearing portion cooperating with said female bearing portion so as to be rotatably guided therein;
an annular groove in said male bearing portion and at least one cooperating connecting block in said female bearing portion for axially locking said first and second tube end portions in rotatable engagement with one another;
two radially open positioning notches arranged on one of the two tube end portions, at an angular spacing of approximately 90°, said notches having substantially parallel radially extending locking flanks, the notches being part of a radial collar of the tube end portion, and the collar portion between the notches defining a slide ledge;
a positioning lever fixedly attached by one of its extremities to the other tube end portion, said lever having a resiliently bendable lever portion extending axially toward said collar with the positioning notches, with a bias in the direction of engagement with one of said notches, said

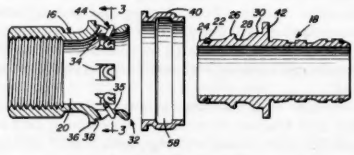


lever portion having two substantially parallel opposite locking faces engageable with the locking flanks of said notches, such engagement providing a rotational locking action between the tube end portions; the positioning lever being bendable, against said bias, out of engagement with a notch and slideable on said slide ledge; and
two oppositely facing abutment shoulders arranged radially above the more distant flanks of the two positioning notches, said shoulders abuting the positioning lever in alignment with a notch, thereby limiting the angular mobility of the positioning lever to said 90° angular spacing.

3,922,011
HOSE COUPLING

Tom Walters, 2102 Mason Blvd., Point Pleasant, W. Va. 25550

Filed Dec. 11, 1973, Ser. No. 423,726
Int. Cl.² F16L 27/00
U.S. Cl. 285—277 8 Claims



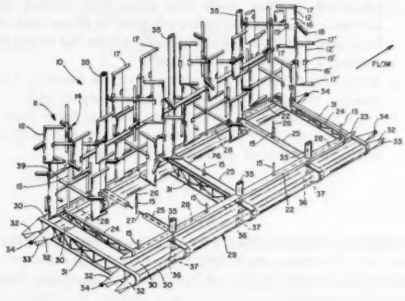
1. In combination with a pair of axially overlapping members adapted to be rotatable relative to each other about a common axis, a coupling assembly comprising an annular spring element, spring retaining means projecting from one of said members in surrounding relation to the other of the members holding the spring element in an elastically undeformed condition, a hook formation projecting radially outwardly from the other of said members axially between the spring element and a shoulder formed axially inwardly from said spring retaining means on said one of the members when the members are coupled together, an operating sleeve having an internal recess receiving said spring element in the undeformed condition thereof, means connected to both of said members jointly supporting the operating sleeve in said coupled position, and means limiting axial displacement of the operating sleeve in one direction against the bias of said spring

element from a coupling position in which said spring element is received in the recess.

3,922,012
POWER GENERATOR

Harry Herz, 1200 Hurlbut Ave., Sebastopol, Calif. 95472

Filed Feb. 28, 1974, Ser. No. 447,033
Int. Cl.² F03B *13/12*
U.S. Cl. 290—43 **12 Claims**



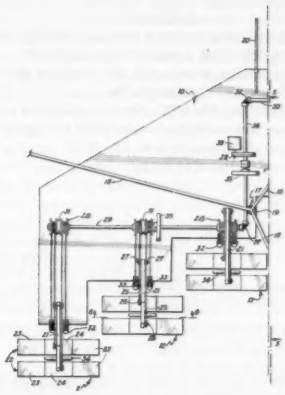
1. A submersible power generator comprising:
   a. rotatable shaft;
   b. plurality of radially disposed spokes carried by said shaft so as to rotate therewith;
   c. plurality of impeller blades hingedly attached to said spokes for movement relative thereto and operable to intersect the water current and be impinged thereby and move therewith to impart torque to said shaft when disposed on one side thereof and to trail freely while moving generally against the water current on the other side of said shaft to develop relatively little resistance to water flow therepast and to impart relatively little torque to said shaft; and
   d. stop mechanism provided by each spoke for positioning the associated blade at an angle to the radial axis of said spoke, and said spoke providing an abutment for positioning the associated blade at an angle to the radial axis of said spoke, said stop mechanism and abutment effective to cause the blade to provide a current flow impingement surface after the spoke has moved into alignment with the axis of water flow, said blade movable between said stop mechanism and said spoke during the portion of said blade's travel in a direction generally with the current, said stop mechanism developing a force aiding rotation of said shaft during the initial portion of said blade's travel in a direction generally against the current.

3,922,013
WAVE MOTOR

Hubert Tidwell, Box 57, Wellington, Utah 84542

Filed Mar. 4, 1974, Ser. No. 447,879
Int. Cl.² F03B *13/12*
U.S. Cl. 290—53 **7 Claims**

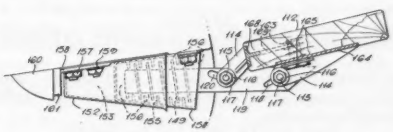
1. A wave motor comprising an offshore support, multiple wave energy conversion units on the support, each conversion uni embodying at least one float-weight assembly adapted to be suspended in the surf, suspension and guidance means for said float-weight assembly of each conversion unit on the support enabling each float-weight assembly to be elevated by waves and to descend under the influence of gravity in a constrained path after the passage of each wave, and power transmission means on said support common to the wave energy conversion units and including one-way active and one-way free wheeling transmission elements one for each said conversion unit, whereby the float-weight assembly of each unit is first elevated by each wave and then released for falling gravity and such falling motion is transmitted through said one-way active transmission elements into useful work energy, and said multiple wave energy conversion units arranged in laterally spaced and stepped relation on said support, whereby progressing laterally each unit is arranged successively closer to the shore in relation to oncoming waves, whereby the wave energy of each wave may be utilized by the wave motor over an extended time interval.



3,922,014
BUMPER MOUNTING

Mitja Victor Hinderks, 15 A Adamson Road, London N.W. 3, England

Filed Apr. 9, 1973, Ser. No. 349,178
Claims priority, application United Kingdom, Apr. 7, 1972, 16079/72
Int. Cl.² B60R *19/02*
U.S. Cl. 293—88 **5 Claims**



1. A vehicle having a protective bumper and bumper support arms which at their respective mountings to the vehicle are provided with flange means embedded in a compressible material contained in a housing having internal flange means both sets of flange means being spaced from each other by the compressible material, and wherein the support arm flange means and housing flange means each comprise a flange of helical configuration.

2. A vehicle having a protective bumper and bumper support arms which at their respective mountings to the vehicle are provided with flange means embedded in a compressible material contained in a housing having internal flange means both sets of flange means being spaced from each other by the compressible material and, wherein the support arm flange means and housing flange means each comprise a plurality of spaced annular flanges.

3. A vehicle having a protective bumper and a pair of bumper support arms which at their respective mountings to the vehicle are provided with flange means embedded in a compressible material contained in a respective pair of housings each having a closed end and internal flange means both sets of flange means being spaced from each other by the compressible material, and wherein the housing is of frusto-conical

configuration and frictionally engages an outer housing of similar configuration a space being formed between the closed ends of the two housings which accommodates a compressible material.

3,922,015

METHOD OF MINING WITH A PROGRAMMED PROFILE GUIDE FOR A MINING MACHINE

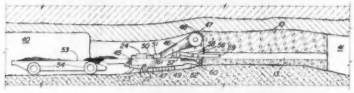
William N. Poundstone, Pittsburgh, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Dec. 17, 1973, Ser. No. 425,345

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² E21C *41/00*

U.S. Cl. 299—1 **6 Claims**



1. A method for mining a mineral deposited underground in a vein having an underburden and an overburden comprising:

a. boring a pilot hole into said vein between said underburden and said overburden;

b. measuring a first mineral thickness between said pilot hole and said overburden at periodic distances along said pilot hole;

c. measuring a second mineral thickness between said pilot hole and said underburden at periodic distances along said pilot hole;

d. storing said first and second measured mineral thickness each with respect to its respective distance along the axis of said borehole from a common point of origin;

e. controlling a mining machine in accordance with said stored information whereby the total mineral removed and the direction of the progress of the mining machine is controlled by said pilot hole and said memory.

3,922,016

TUNNELLING MACHINE ON SKIDS WITH EXTENSIBLE WHEELS

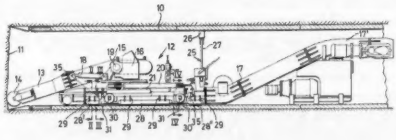
Willy Tyslauk, Altlunen, and Gunther Bargel, Werne, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed May 14, 1974, Ser. No. 469,726

Claims priority, application Germany, May 25, 1973, 2326653

Int. Cl.² E21D *9/08*

U.S. Cl. 299—31 **10 Claims**



1. A tunnelling apparatus for installation in one or more of a series of tunnel lining sections, said apparatus comprising:

a. a main frame having a plurality of skids attached thereto which normally bear against said tunnel lining section;

b. a jib supported by said main frame;

c. means for moving the jib relative to said main frame;

d. means for detaching material from a working face to effect advancement of the tunnel, said detaching means being located at the effect advancement of the tunnel, said detaching means being located at the free end of the jib;

e. at least one first wheel assembly attached to said main frame capable of movement between a retracted and an extended position, such that when said first wheel assembly is in its extended position it raises said skids from said tunnel lining section and allows the frame to be displaced generally longitudinally;

f. at least one second wheel assembly attached to said main frame capable of movement between a retracted and an extended position, such that when said second wheel assembly is in its extended position it raises said skids from said tunnel lining section and allows the frame to be displaced generally transversally;

g. anchoring means for anchoring the main frame in a fixed position relative to the tunnel lining section; and

h. conveyor means for transferring material away from the working face, said main frame constructed so as to form a trough portion of said conveyor means.

3,922,017

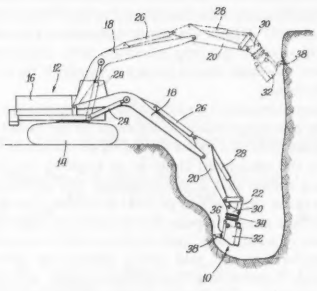
IMPACT MATERIAL FRACTURING DEVICE FOR EXCAVATORS AND THE LIKE

Delwin Earl Cobb, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 390,912, Aug. 23, 1973. This application Dec. 16, 1974, Ser. No. 533,192

Int. Cl.² E21C *27/28*

U.S. Cl. 299—70 **20 Claims**



15. A mechanically driven impact fracturing apparatus, said apparatus comprising:

a housing;

an elongated fracturing shank pivotally mounted at one end to said housing member for oscillatory movement about said pivotal mounting and including a fracturing tip at the other end;

a drive shaft rotatably mounted in said housing and extending substantially parallel to said shank and in the plane of oscillation thereof;

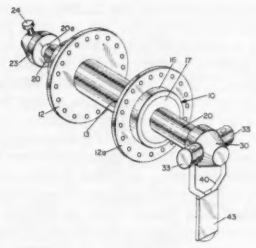
said drive shaft including an eccentric journal for rotation therewith; and

an impact member supported in said housing for impact engagement with said shank, and including substantially rigid means journaled to said eccentric journal for establishing a positive connection of said impact member to said eccentric journal.

3,922,018
SEPARABLE BEARING AXLE ASSEMBLY AND SUPPORTED HUB OF A BICYCLE WHEEL OR THE LIKE

William B. Shook, Columbus, assignor to Thurston, Inc., Columbus, Ohio

Filed Dec. 18, 1974, Ser. No. 533,885
Int. Cl.² B60B 27/00
U.S. Cl. 301—105 B 6 Claims

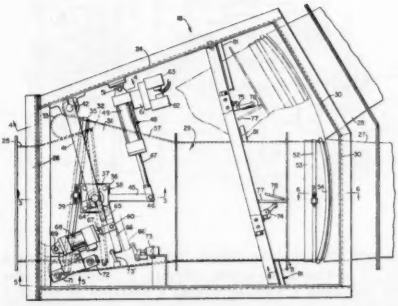


1. A wheel-supporting assembly comprising a hub having a central sleeve and outwardly-opening concentric bearing-receiving sockets at its opposed ends, concentric bearing units slipped into said sockets, a spacer sleeve concentric within the central sleeve into which it is slipped and having opposed ends engage the bearing units, an axle sleeve slipped through said spacer sleeve and the aligned bearing units and having its ends projecting outwardly from the respective bearing units, concentric cups disposed on the outer ends of said axle sleeve and having inwardly projecting skirts for engagement with the respective bearing units, each of said cups having portions fitting into mounting openings in wheel-supporting frame members, and means for holding the assembled parts axially together and within said members.

3,922,019
DIVERTER VALVES

W. T. S. Montgomery, Jr., c/o Montgomery Industries Int'l, P.O. Box 3687, Jacksonville, Fla. 32206

Filed Nov. 30, 1973, Ser. No. 420,583
Int. Cl.² B65G 53/56
U.S. Cl. 302—28 11 Claims

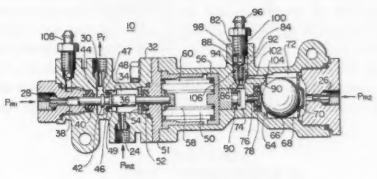


1. In a diverter valve for a pneumatic transport system, a housing having means defining a first opening in one wall and means defining a plurality of adjacent second openings in another wall, said housing being fluid pressure tight except for said openings, valve tube means swingably mounted within said housing for angular and longitudinal displacement by a support structure that has a fixed axis pivot mounting on said housing and a pivotal connection on said valve tube means, said valve tube means being connected at one end flexibly in fluid pressure tight relation to said one opening and having means at its other end for fluid pressure tight connection to one or the other of said second openings, and means for selectively moving said valve tube means within the housing for connecting said other end to one or the other of said second openings comprising a first reversible motor means connected to displace said valve tube means longitudinally for sealed connection or disconnection with a second opening only when said other end of said valve tube means is aligned with one or the other of said second openings, said first reversible motor means being connected at one end to said housing and at its other end to said support structure pivotal connection on said valve tube means, and a second reversible motor means connected to angularly displace said tube about said pivotal connection between positions in operative alignment with one or the other of said second openings only when said valve tube means has been longitudinally disconnected from one or the other of said second openings, said second reversible motor means being connected at one end to said housing and at its other end to said support structure pivotal connection on said valve tube means.

3,922,020
FLUID PRESSURE CONTROLLING DEVICE FOR BRAKE SYSTEM OF WHEELED VEHICLE

Yoshitaka Koike, and Keiichiro Yabuta, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama City, Japan

Filed Jan. 31, 1975, Ser. No. 545,916
Int. Cl.² B60T 13/06
U.S. Cl. 303—6 C 7 Claims



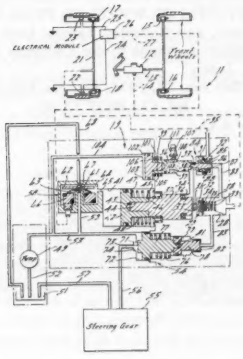
1. A fluid pressure controlling device for a hydraulic brake system for a wheeled vehicle, the system being capable of developing independent and variable first and second fluid pressures for the front and rear brakes of the vehicle, the controlling device comprising: a housing having therein a stepped bore; a differential plunger axially movably received in said bore, a first inlet port for supplying said first fluid pressure to a first end face of said plunger; a second inlet port fluidly separate from said first inlet port for supplying said second fluid pressure to a middle portion of said plunger; an outlet port communicable with said second inlet port through said bore; a piston axially movably received in said bore opposite to a second end face of said plunger, said piston and said second end face being fluidly isolated from said first and second inlet ports; a first compression spring installed between said second end face and said piston to exert a force on said second end face; a third inlet port for supplying one of said first and second fluid pressures to an end face of said piston remoter from said plunger; a deceleration-responsive member movably received in said bore between said piston and said third inlet port; means to regulate the magnitude of a load on said compression spring resulting from said one fluid pressure acting on said piston; and a valve means to break the fluid communication between said third inlet port and said piston when said member is seated thereon; said bore and said plunger being shaped such, and said second inlet port and said outlet port being arranged such that said second fluid pressure at said second inlet port is transmitted to said outlet port without modulation when the magnitude thereof is below a critical value but modulated to a third fluid pressure when the

magnitude thereof exceeds said critical value, the rate of increase in said third fluid pressure being lower than, inclusive of zero, the rate of increase in said second fluid pressure; the areas of said first and second end faces of said plunger being correlated with each other such that said critical value is raised when said first fluid pressure is not substantially supplied to said first inlet port; said member being seated on said valve means when the device is subjected to a deceleration larger than a predetermined magnitude to prevent said load from increasing as said one fluid pressure increases thereafter; said load being regulated such that said critical value is raised as the gross weight of the vehicle increases.

3,922,021
HYDRAULIC SKID CONTROL SYSTEM EMBODYING REGULATOR

Peter Every, Livonia, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Aug. 24, 1973, Ser. No. 391,491
Int. Cl.² B60T *8/02*
U.S. Cl. 303—21 F **9 Claims**



1. A skid control system for a vehicle having at least one wheel brake, actuating means including a hydraulic circuit for selectively operating said wheel brake, and means for modifying the actuation of the wheel brake in response to a predetermined signal to prevent a skid condition, said means including a pump for delivering fluid under pressure and regulator means for maintaining at least a predetermined pressure in the output of said pump, said regulator means being responsive to the pressure in said brake hydraulic circuit for altering the predetermined pressure in response to variance in the brake hydraulic circuit pressure.

3,922,022
SKID CONTROL BRAKING SYSTEM

Takeshi Ochiai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

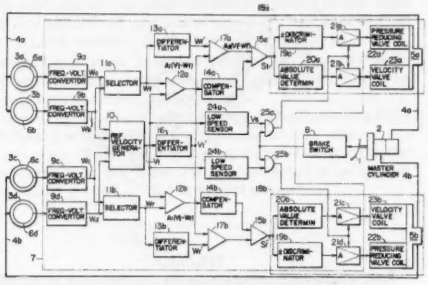
Filed Jan. 14, 1974, Ser. No. 433,004
Claims priority, application Japan, Feb. 9, 1973, 48-15679
Int. Cl.² B60T *8/08*
U.S. Cl. 303—21 P **38 Claims**

1. An apparatus for modulating the brake force applied to the brakes of wheels of a vehicle, comprising:

sensor means coupled to the wheels for forming wheel speed signals corresponding to the speeds of the wheels;

circuit means coupled to said sensor means for establishing a wheel speed composite signal representing a composite of the speeds of the wheels and a reference signal derived from the speeds of the wheels and variable at a rate slower than the composite signal;

control signal forming means coupled to said circuit means for producing a control signal representing a sum of a value proportional to both the positive and negative difference between the composite signal and the reference signal and a value proportional to both the positive and negative difference between the differential of the com-



posite signal and the differential of the reference signal;

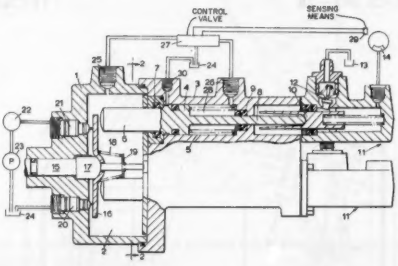
modulating means responsive to said forming means for changing the force on the basis of the control signal; and

modulation speed regulating means responsive to said forming means and coupled to said modulating means for varying the rate at which the modulating means modulates the force on the basis of the magnitude of the control signal.

3,922,023
VEHICLE HYDRAULIC BRAKING SYSTEM WITH INDEPENDENT BRAKE CIRCUITS

David Anthony Harries, Shirley, England, assignor to Girling Limited, Birmingham, England

Filed Mar. 28, 1974, Ser. No. 455,746
Claims priority, application United Kingdom, Mar. 29, 1973, 15029/73
Int. Cl.² B60T *8/06*, *13/00*
U.S. Cl. 303—21 F **6 Claims**



1. An hydraulic braking system for vehicles comprising a plurality of independent brake circuits; a master cylinder assembly including a housing having a plurality of bores, a plurality of master cylinders arranged in said housing corresponding in number to said master cylinders and each master cylinder is connected in at least one of said circuits, and booster means in said housing for at least partially operating all of said master cylinders by fluid pressure, said booster means being arranged so that a failure in one brake circuit does not affect the operation of the remaining master cylinders; a source of hydraulic fluid under pressure; and manually operated valve means for controlling the supply of fluid from said source to said booster means, said booster means com-

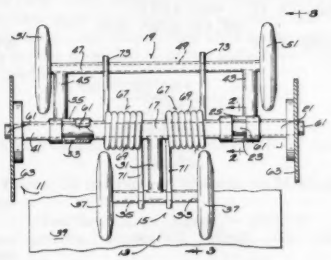
prising a booster chamber in said housing, and a plurality of modulator pistons working in said bores to operate said master cylinders, being movable between retracted and advanced positions, each modulator piston being of stepped outline and having a first end exposed to said booster chamber, a second opposite end of an area less than that of said first end and acting to operate a corresponding one of said master cylinders, and an intermediate portion of an area greater than that of said first end and providing a reaction face of an effective area greater than that of said first end and exposed to a portion of said bore on the side of said intermediate portion remote from said first end which defines a control space, a plurality of control valves each providing communication between said booster chamber and a corresponding one of said control spaces and movable between a closed position and an open position, and a plurality of anti-skid sensing means each responsive to deceleration of a braked wheel in one of said brake circuits to control operation of the one said control valve which controls communication between said booster chamber and said control space for the master cylinder which control the said one of said brake circuits, each anti-skid sensing means being operative when the deceleration of the corresponding braked wheel exceeds a predetermined value to open the said control valve controlled thereby and connect said control space to said booster chamber whereby equal fluid pressure acting over different areas of said modulator piston apply thereto a resultant force to urge said modulator piston into said retracted position to relieve the braking effect of said braked wheel independently of operation of the other of said master cylinders.

3,922,024

BOGIE SUSPENSION SYSTEM

David J. Burkhardt, Brookfield, Wis., and Clair D. Splittstoesser, Roseau, Minn., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 26, 1973, Ser. No. 427,544
Int. Cl.² B62D *55/16*
U.S. Cl. 305—27 **9 Claims**



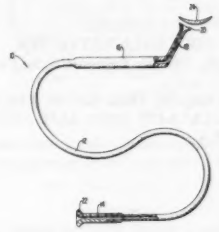
8. A truck suspension comprising a frame, a first bogie wheel supporting truck including a first sleeve, a second bogie wheel supporting truck including a second sleeve, means pivotally mounting said first and second trucks on said frame for rotary movement of said sleeves about a common axis relative to said frame and to each other, first and second stop members respectively extending axially from said first and second sleeves and engageable with each other for preventing pivotal movement of said trucks toward each other beyond a predetermined angle, means biasing said first and second trucks for pivotal movement toward each other and means for varying the bias exerted by said biasing means on said trucks.

3,922,025

METHOD AND APPARATUS FOR APPLYING AND REMOVING CONTACT LENSES

Edward R. Updegraff, 2131 Florida Ave., NW. Apt. 1, Washington, D.C. 20008

Filed July 17, 1970, Ser. No. 55,663
Int. Cl.² A61F *9/00*
U.S. Cl. 294—1 CA **1 Claim**



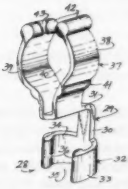
1. The method of removing a contact lens from an eye comprising the steps of placing in the mouth one end of an elongated flexible tube having mounted on its other end a suction cup element having a diameter no greater than about half the diameter of the contact lens to be removed, looking into a mirror through the lens to be removed and simultaneously placing the suction cup into contact with one side portion only of the lens to thereby permit continuous viewing of the mirror through the lens past said suction cup to provide unobstructed observation of the operation by the eye from which the lens is to be removed, applying a suction through the flexible tube to the suction cup to releasably secure the lens to the suction cup, and manually removing the lens from the eye while maintaining the suction in the tube and suction cup by applying a lifting pressure to said one side of the lens.

3,922,026

PICK UP CLIP DEVICE

James C. Schweitzer, Milwaukee, Wis., assignor to Melvin J. Douyette, Sr., Oak Creek, Wis., a part interest

Continuation-in-part of Ser. No. 841,459, July 14, 1969, abandoned. This application Aug. 9, 1971, Ser. No. 170,219
Int. Cl.² A63B *47/02*
U.S. Cl. 294—19 A **1 Claim**



1. A one-piece molded plastic pick up clip device for removable attachment to the shaft of a golf club or the like, comprising a frame angle member having a pair of legs, the first leg of the frame angle member being adapted to extend along the side of a shaft with the second leg extending over and seating on the end of the shaft, a first generally U-shaped spring clip carried by the first frame member leg and being spaced from and generally paralleling the second frame member leg and being adapted to grip a shaft from the side and thereby removably secure the clip device to the shaft with the second frame member leg seated on the end of the shaft, and a second generally U-shaped spring clip carried by the second frame member leg and extending in a direction generally opposite from the first frame member leg and having opposed

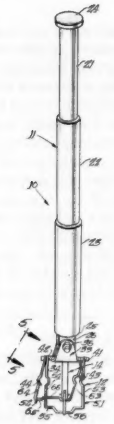
arms disposed generally symmetrical relative to a plane through the longitudinal centerlines of the respective frame member legs and being adapted to grasp an object with axial thrust of the shaft upon which the pick up clip device is removably attached, said opposed arms having at least one groove at the entrance to the clip opening and which generally parallels the direction of thrust for pick up for guiding a golf ball into the clip.

3,922,027

GOLF BALL RETRIEVER

Norman F. Nesselt, 737 W. Dayton Circle, Fort Lauderdale, Fla. 33312

Filed Nov. 29, 1974, Ser. No. 528,251
Int. Cl.² A47F *13/06*; A63B *57/00*
U.S. Cl. 294—19 A **3 Claims**



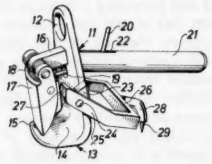
1. A golf ball retriever comprising, in combination:
a handle having a plurality of frictionally engaged telescoping sections;
a U-shaped bracket affixed centrally to a bottom one of said telescoping sections and extending outwardly therefrom with its bight portion spaced furthest from such section; a pivot pin retained in said bight portion and extending outwardly from opposite ends thereof;
a cylindrically coiled spring disposed concentric on said pivot pin and having its opposed ends extending radially outwardly relative to said pivot pin;
a pair of substantially indentical jaw members each pivotally connected to the end portions of said pivot pin and extending downwardly therefrom;
one end of said spring engaging one of said jaw members with the opposite end of said spring engaging the opposite one of said jaw members in a manner to spring bias said jaw members in a pivotal direction about the axis of said pin in a direction toward each other; and
toggle means for releasably holding said opposed jaw members in spaced apart relationship and operable to release said jaw members for movement in a direction toward each other under force of said spring.

3,922,028

CARGO HOOK

Stig Svensson, and Stig Lindgren, both of Ramnas, Sweden, assignors to Bulten-Kanthal Aktiebolag, Sweden

Filed Nov. 6, 1973, Ser. No. 413,412
Int. Cl.² B66C *1/36*
U.S. Cl. 294—82 R **5 Claims**



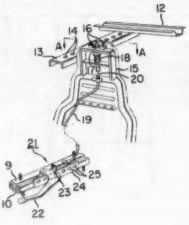
1. A cargo hook for lifting an object tied by binding means, comprising in combination:
a. a shank portion having a lifting connection at one end, and a wedge-shaped tip portion integral with the other end and having a linear lifting surface, arcuate in cross-section, extending at an acute angle therewith in underlying relation to said lifting connection to define a hook gap;
b. a handle rigidly connected to said shank portion and projecting away from said tip portion;
c. a support arm having a free end on the side of said shank portion opposite to said tip portion;
d. journal means between said tip portion and said lifting connection and pivotally connecting the other end of said support arm to said shank portion; and
e. a pointed engagement element on said free end for engaging the object remotely from said binding means.

3,922,029

SEAT MOUNTING DEVICE FOR VEHICLE

Muneharu Urai, Higashiyamato, Japan, assignor to Takeji Saito, Toyko, Japan

Filed Apr. 10, 1974, Ser. No. 459,554
Claims priority, application Japan, Apr. 20, 1973, 48-44097; Apr. 23, 1973, 48-47422[U]
Int. Cl.² B60N *1/08*
U.S. Cl. 296—65 A **5 Claims**

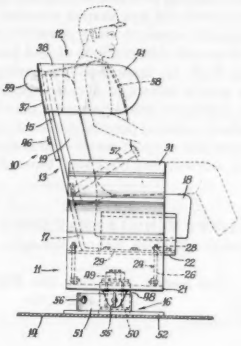


1. A device for use in a vehicle for mounting a seat consisting of at least a sitting portion and a back rest portion, comprising means for slidably mounting said sitting portion of said seat on the floor surface of the vehicle body, first locking means for locking said sitting portion of said seat against sliding movement relative to the vehicle body, an extension extending upward from the upper end of said back rest portion of said seat, means for adjustably securing said extension to the ceiling of the vehicle body so as to permit sliding movement of said extension relative to the ceiling, second locking means for locking said extension against movement relative to the ceiling, and interlocking means for causing interlocking operation of said first and second locking means.

3,922,030
PROTECTIVE SEAT

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 24, 1974, Ser. No. 482,510
Int. Cl.² B60N 1/02
U.S. Cl. 296—65 A 16 Claims



1. A safety seat system for a vehicle having a mounting surface, said seat system including;

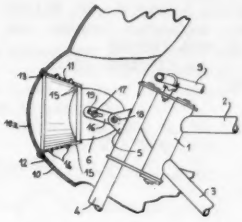
suspension means for supporting a seating portion of said system and for absorbing shock loading transmitted to said seating portion, said suspension means including; first rigid base plate means, second rigid plate means for mounting said seating portion, first resilient element means disposed between said first and second rigid plate means for resiliently supporting said second plate means upon said first plate means, hold-down means connected between said first and second rigid plate means for limiting movement of said second plate means with respect to said first plate means in a direction normally away from said first plate means while permitting movement of said second plate means in lateral directions parallel to said first plate means, separate mounting means different from said first rigid plate means for mounting said first rigid plate means, said second rigid plate means and said seating portion upon said mounting surface for rotation with respect thereto.

3,922,031
MOTORCYCLE SCREEN AND METHOD OF MAKING SAME

Daniel Hugon, 38 rue Pasteur, Moirans, en Montagne, Jura, France

Filed Nov. 12, 1973, Ser. No. 415,133
Claims priority, application France, Feb. 12, 1973, 73.06384
Int. Cl.² B62J 17/02
U.S. Cl. 296—78.1 7 Claims

1. A motorcycle screen for channeling a light beam from a headlight mounted on the motorcycle through a window opening in a wind deflector fixed on the motorcycle in front of the headlight, the light channeling screen comprising an opaque sleeve extending from the headlight all the way through the window opening in front of said deflector and confining the light beam emitted by the headlight to shine in front of the deflector, said sleeve being made of an elastomeric material and having a forward periphery shaped to be clamped all the way around said periphery to the deflector at said window opening so that the light channeling screen is supported by and positively fixed to the said deflector to prevent lateral escape of light rays between the front edge of the sleeve and the deflector on which it is mounted thereby preventing glare of light on the deflector, the forward periphery of the sleeve including an annular groove opening outward and engaging

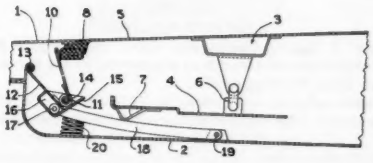


and gripping the edge of said window opening provided in the deflector for the passage of the said sleeve therethrough.

3,922,032
SLIDING ROOF DEVICE WITH A DEFLECTOR

Jean-Pierre Schaller, Raynans, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Feb. 7, 1975, Ser. No. 547,950
Claims priority, application France, Feb. 26, 1974, 74.06522
Int. Cl.² B60J 7/22
U.S. Cl. 296—137 J 4 Claims

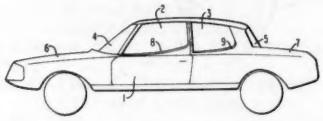


2. A sliding roof device for a vehicle, the device comprising a frame for fixing to a fixed part of a roof of the vehicle, a roof part movable with respect to the frame between a roof-closing position and a roof-opening position, a support mounted to be pivotable relative to the frame, a retractable deflector pivotally connected to the support and disposed in a front part of the frame relative to the usual direction of movement of the vehicle, elastically yieldable means for opening the angle made between the interconnected deflector and support, abutment means interposed between the deflector and the support for determining a maximum value of said angle, an actuating lever mounted to be movable relative to the frame and connected to the support to move the support between a first position corresponding to a retracted position of the deflector and a second position corresponding to an operative projecting position of the deflector, second elastically yieldable means for biasing the lever in a direction to put the support in said second position, a shoe integral with the movable roof part and cooperative with the lever to shift the lever to the position of the lever corresponding to said first position of the support when the movable roof part is moved to said roof-closing position and to allow the lever to be shifted by the second elastically yieldable means to the position of the lever corresponding to said second position of the support, when the movable roof part is moved to said roof-opening position, the movable roof part having means defining a front edge relative to the normal direction of movement of the vehicle which front edge is capable of engaging and shifting the deflector to reduce said angle in opposition to the action of the first elastically yieldable means when the movable roof part is moved to said roof-closing position.

3,922,033
PASSENGER MOTOR VEHICLE

Karl Wilfert, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 8, 1969, Ser. No. 864,658
Claims priority, application Germany, Oct. 16, 1968, 1803305; Nov. 20, 1968, 1809887
Int. Cl.² B60J 1/08
U.S. Cl. 296—146 **20 Claims**

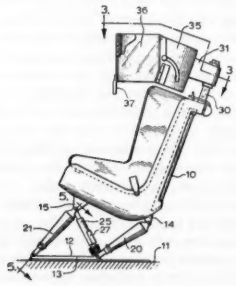


1. A passenger motor vehicle with two side windows disposed one behind the other, characterized in that the lower edges of the window openings rise in the rearward direction and the beginning of the lower edge of the rear window opening is disposed lower than the rear end of the lower edge of the front window opening, said window openings being disposed immediately adjacent one another separated only by vehicle body parts forming a rear upwardly extending edge of the front window opening and a front upwardly extending edge of the rear window opening, and characterized in that the body parts forming the rear, upwardly directed edges of the side windows slope forwardly in the downward direction from the upper to lower ends thereof.

3,922,034
ARMORED HEADREST

Walter S. Eggert, Huntingdon Valley, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 418,338, Nov. 23, 1973, abandoned. This application Apr. 9, 1975, Ser. No. 566,465
Int. Cl.² A47C 7/38; B60R 21/10
U.S. Cl. 297—216 **1 Claim**



1. An improved removable armored headrest system for an armoved helicopter chair comprising;

a. a chair having a seat portion and a back support portion;

b. a support member movably attached to said back portion of said chair; said support member having a substantially elongated tubular shape and having a rectangular end section extending a substantial distance above said back support position of said chair;

c. a neck member having first and second end portions, said first end portion formed into a hollow cylindrical member to completely enclose and extend a substantial distance along said rectangular end of said support member, said second end portion formed into a wye shaped member to extend in a forward direction from said back support portion;

d. resilient material in intimate contact with external surfaces of said rectangular end section, said resilient material extending completely within said hollow cylindrical member for forming a resilient pivot coupling between said hollow cylindrical member and said rectangular end section;

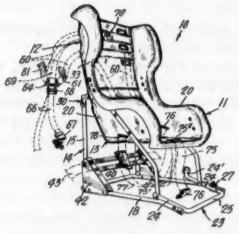
e. a headrest having first and second side portions attached to said second end wye shaped member; and,

f. a transparent armored visor pivotably mounted to said first and second side portions of said headrest, said visor pivoting from an open position having no constraints upon a pilot's helmet to a closed position having constraints applied to movement of a pilot's head; whereby the resilient material permits the headrest to rotate angularly about the support member and allows absorbing of forward, sideway and backward blows during crashes.

3,922,035
SAFETY VEHICLE SEAT STRUCTURE

Hyman Wener, 482-94th Ave., Chomedey, Laval, Quebec, Canada

Filed Aug. 9, 1974, Ser. No. 496,054
Int. Cl.² A47D 1/10
U.S. Cl. 297—250 **12 Claims**



1. A safety vehicle seat structure comprising a seat having a backrest and a seat portion, a support frame secured to said seat, said support frame comprising a pair of spaced apart vertical back support members each pivotally secured at their upper ends to a respective side of said backrest, each said vertical back support members having a lower end secured to a respective one of two horizontal support members located below said seat portion, at least one connecting member secured to said seat portion forwardly of said back support members and extending therebelow to pivotally interconnect with a displaceable lever framework whereby actuation of said lever framework will cause displacement of said seat between two positions relative to said support frame, said displaceable lever framework including a frame having opposed parallel arms and an interconnecting arm connected between said opposed arms, each said opposed parallel arms being pivotally interconnected near said interconnecting arm to a respective one of said two horizontal support members below said seat portion, one of said opposed arms being pivotally interconnected at its free end with said at least one connecting member, one of said opposed arms being lockable with one of said horizontal support members.

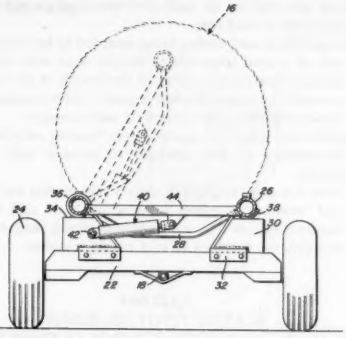
3,922,036
BALE TRANSFER AND FEEDER

Marvin L. Kalsbeck, 105-1st St., North, and Glendon P. Kurkela, R.R. No. 1, Box 45, both of, Estelline, S. Dak. 57234

Filed July 25, 1974, Ser. No. 491,946
Int. Cl.² B60P 1/16
U.S. Cl. 298—18 **5 Claims**

5. In combination with an elongated trailer having a longitudinal frame connected to at least two transverse axles rotat-

ably mounting vehicle wheels, support brackets secured to each of said axles adjacent to the wheels having horizontal support surfaces vertically spaced above said axles, a load supporting bed including a pair of elongated frame members positioned on said support surfaces, and a feed retaining rack including a plurality of bottom rods secured to the elongated frame members, a pair of longitudinal rods interconnecting



the bottom rods in laterally spaced relation to the frame members, and a pair of fence assemblies connected to said longitudinal rods extending upwardly therefrom in diverging relation to each other, and means pivotally connecting the one of the elongated frame members to the bracket and power operated means interconnected between said brackets and the load supporting bed for laterally displacing the feed retaining rack.

3,922,037

ROTARY MEMBER HOLDING ASSEMBLY

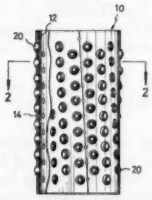
Teruo Yamada, 17-17, 2-chome Azusawa; Takeo Yamada, 63,4-chome Maeno-cho, and Tsunehiko Uchisaka, 17-1,1-chome Naka-cho, all of Tokyo, Japan

Continuation-in-part of Ser. No. 296,065, July 5, 1972, abandoned. This application June 10, 1974, Ser. No. 477,868

Claims priority, application Japan, June 30, 1971, 46-047898; June 30, 1971, 46-047899; July 8, 1971, 46-050471; Dec. 13, 1971, 46-100913; Dec. 27, 1971, 46-153; May 6, 1972, 47-44845

Int. Cl.² F16C *21/00*

U.S. Cl. 308—6 B **3 Claims**



1. A rotary member holding assembly comprising an inner cylindrical member having a plurality of spaced openings, an outer cylindrical member disposed in abutting relationship about said inner cylindrical member and having a plurality of spaced openings generally aligned with the spaced openings in said inner cylindrical member, a plurality of rotary members disposed in said aligned openings, said outer cylindrical member having ball-retaining flanges concentrically disposed about the spaced openings therein, said ball-retaining flanges project outwardly from the outer surface of said outer cylindrical member, said rotary members being spherical with said ball-retaining flange having a partial spherical configuration conforming generally to the spherical configuration of said rotary members, and said inner cylindrical member having ball-retaining rings concentrically disposed within said spaced openings therein.

3,922,038

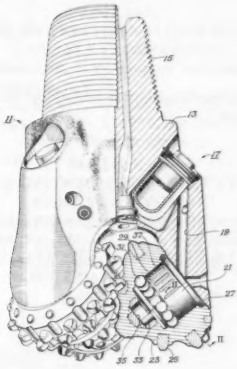
WEAR RESISTANT BORONIZED SURFACES AND BORONIZING METHODS

Stanley R. Scales, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Aug. 10, 1973, Ser. No. 387,566

Int. Cl.² F16C *19/00*

U.S. Cl. 308—8.2 **8 Claims**



1. In an earth boring drill bit having at least one rotatable cutter supported on a steel bearing pin, the improvement which comprises:

a carburized friction bearing surface formed on said steel bearing pin;

a boronized surface formed on said carburized bearing surface;

said carburized surface being hardened and tempered by heat treatment;

whereby the wear resistant boronized surface has a tough and strong supporting base to sustain large loads imposed by a mating friction bearing in said rotatable cutter and avoid brittle fracture.

3,922,039

DUST GUARD FOR JOURNAL BOX

Philip Karpuk, 59 Stirton Ave., Hamilton, Ontario, and Philip Edward Karpuk, 75 Broadway Ave., Toronto, Ontario, both of Canada

Filed July 29, 1974, Ser. No. 492,550

Int. Cl.² F16C *1/24*

U.S. Cl. 308—36.1 **9 Claims**

1. A dust guard for a journal box, comprising:

a frame suspendable in the journal box;

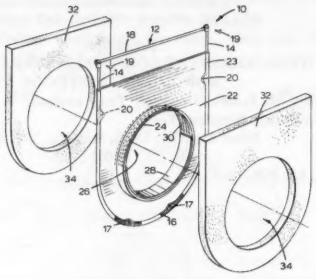
a sealing ring of stiffly resilient material;

a membrane of flexible, oil impervious material mounted on the frame, the sealing ring being sealed circumferentially to the membrane in the plane thereof to provide a passage therethrough and to float within the frame; and

a pair of planar packing members of resilient material each having an aperture therein to receive the sealing ring concentrically and mounted against the membrane one on each side thereof;

the frame comprising a U-shaped element having a pair of arms and a base portion, the free ends of the arms projecting from the packing member and having a crossbar

removably attached thereto to form suspension means, the base portion being pivotally connected to the arms



whereby the dust guard is distortable in the plane of the membrane.

3,922,040

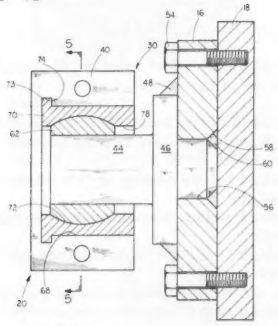
HEAVY DUTY TRUNNION MOUNTING FOR AN EARTH MOVING VEHICLE

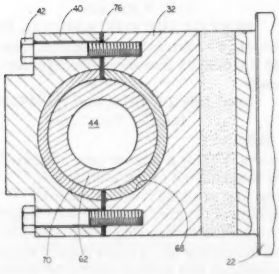
Lewis D. Carter, Riverside Road, Box 6, Korbel, Calif. 95550

Continuation-in-part of Ser. No. 237,364, March 13, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,063

Int. Cl.[2] F16C *25/00*

U.S. Cl. 308—72 **3 Claims**





1. In an earth moving vehicle having load transmitting pusher arms which are pivotable through a limited arc and having a working implement attached to the ends thereof, the improvement comprising: a heavy duty trunnion mounting for each of said arms including

a pin;

mounting means for securing said pin to the frame of said vehicle;

an annular trunnion member having a spherical outer surface immovably carried on said pin;

a casing in two sections;

each section of said casing having a recess therein and a planar mating surface extending on two sides parallel to said pin and on an outboard intermediate side along a diameter of said pin;

one section of said casing being adapted to be welded to the end of a load transmitting pusher arm with the mating surface thereof transverse to the length of an arm;

a one-half bearing member segment interchangeably and removably received in each of said recesses;

a spherical surface on each of said bearing members complementary to and adapted to receive said trunnion sleeve;

at least one shim engaged between said mating surfaces and said bearing segments holding each of said segments nonrotatably in its casing section recess; and means for securing the sections of said casing together.

3,922,041

ELASTIC PIVOT BEARINGS

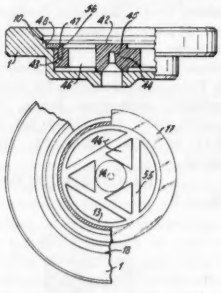
Henry Quaile, and Paul Piguet, both of La Chaux de Fonds, Switzerland, assignors to Portescap, La Chaux de Fonds, Switzerland

Division of Ser. No. 155,580, June 22, 1971. This application Jan. 29, 1973, Ser. No. 327,645

Claims priority, application Switzerland, June 25, 1970, 9626/70; July 6, 1970, 10177/70

Int. Cl. F16c *23/00*

U.S. Cl. 58—140 A **7 Claims**

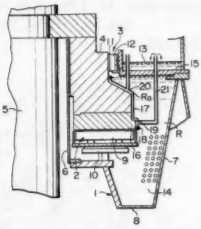


1. A watch bearing comprising in combination, a metallic housing small enough to form a part of a bearing of a watch; an elastic one-piece bearing member having a central zone formed of a self-lubricating plastic material and having an aperture therein for receiving the end of a shaft, said bearing member including a mounting zone surrounding said central zone for elastically securing said central zone to said housing, said mounting zone having a plurality of hollow uniformly distributed spaces of predetermined configuration formed therein and extending completely through said bearing to define a plurality of flexible arms extending from said central zone; said arms extend angularly outwardly from said central zone along line which are angularly related to radii of said central zone; said arms, when viewed in plan, define a generally equilateral triangle connected at its apices to said mounting zone, and connected to said central zone at intermediate portions of the legs of said triangle, thereby to provide flexibility in said bearing.

3,922,042
THRUST BEARING DEVICE

Hiroshi Sato; Yosio Furukawa, and Koji Ozawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 18, 1974, Ser. No. 452,280
Claims priority, application Japan, Mar. 19, 1973, 48-31025
Int. Cl.² F16C 17/06
U.S. Cl. 308—160 4 Claims

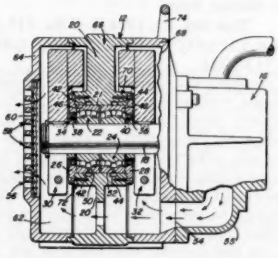


1. In a thrust bearing device, the improvements comprising:
a circular lubricating oil tank surrounding a rotary shaft at a given spacing from said rotary shaft;
lubricating oil filled in said lubricating oil tank;
a thrust bearing disposed in a bottom portion of said lubricating oil tank;
a skirt-shaped bearing collar slidingly rotating along a surface of said thrust bearing with rotation of said rotary shaft; and
a fixed oil seal cover mounted around the outer peripheral surface of said bearing collar in spaced relation thereto, thereby defining an air chamber between said oil seal cover and the outer periphery of said bearing collar;
said oil seal cover being provided with an air intake port for communicating said air chamber with atmosphere outside the lubricating oil and a lubricating oil discharge port having one end connected to said air chamber and the other end extending above the lubricating oil surface for discharging from said air chamber the lubricating oil dwelling therein by resorting to lubricating oil discharge means, thereby emptying said air chamber.

3,922,043
VIBRATOR

Lawrence K. Tompkins, Pecos Lane, Little Rock, Ark. 72207, and John Fallows, 1215 Old Charter Court, Little Rock, Ark. 72205

Filed June 18, 1974, Ser. No. 480,497
Int. Cl.² F16C 1/24
U.S. Cl. 308—187 4 Claims



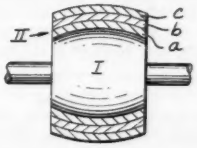
1. A vibrator, the improvement comprising:

a. a housing assembly including a web provided with an opening and provided with a lubricant containing recess communicating with the opening;
b. a rotatable shaft extending into the housing and through the opening provided in the web;
c. a bearing including an outer race arranged within the web opening for rotatably mounting the shaft within the housing assembly, the outer race having a hole formed therein and arranged to permit lubricant to flow through the outer race and into the lubricant containing recess provided in the web; and
d. seal means disposed within the housing assembly for confining the lubricant within the bearing, the web opening and the lubricant containing recess.

3,922,044
ASSEMBLIES OF PRECISION-FITTED RELATIVELY MOVABLE COMPONENTS

Louis Bucalo, Holbrook, N.Y., assignor to Kinemotive Corporation, Farmingdale, N.Y.

Division of Ser. No. 91,497, Nov. 20, 1970, Pat. No. 3,712,338.
This application Oct. 5, 1972, Ser. No. 295,103
Int. Cl. F16c 33/00
U.S. Cl. 308—237 12 Claims



1. In a permanent assembly of at least two components having a common axis and at least one of which is movable into different positions with respect and relative to the other and with respect to said axis while remaining assembled with said other component, comprising an inner component and an outer component surrounding said inner component, said inner and outer components respectively having non-adhering outer and inner complementary surfaces directed toward and directly engaging each other in slidable surface-to-surface contact at substantial portions of the areas of said surfaces, and one of said components being composed of a series of integrated molecular layers surrounding said axis and sequentially deposited upon each other to build up the thickness of said one component, with the first deposited molecular layer of said one component forming the complementary surface of said one component and having a configuration shaped during deposition by direct contact with said complementary surface of said other component.

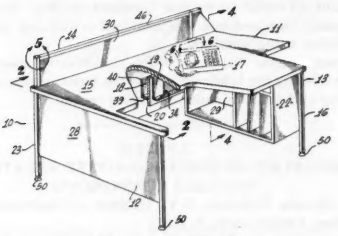
3,922,045
MODULAR STRUCTURE

Lawrence F. Meyer, 4054 W. 136th St., Hawthorne, Calif. 90250

Filed Nov. 12, 1973, Ser. No. 414,671
Int. Cl.² A47B 87/00, 13/02
U.S. Cl. 312—108 3 Claims

1. In a modular structure comprising at least two adjacent modular sections, each of said modular sections including forward and rear support posts, upper and lower lateral support members extending between opposing faces of said forward and rear support posts and a panel carried between each of said upper and lower lateral support members, at least one of said panels defining a common side between said adjacent modular sections, the improvement comprising:
said panel defining said common side being provided with a cut out portion extending downwardly from the upper edge of said panel, whereby the upper edge thereof is interrupted;

said upper lateral support member for said panel defining said common side consisting of a pair of sections each of said sections having one end adapted for locking engagement with said support posts and an opposite end for engagement with said panel adjacent the edges defined by said cut out portion, and



an upwardly opening channel contained within said cut out portion and communicating between said adjacent modular sections thereby to define a continuous open topped raceway extending through said modular structure, and access to the raceway interior through the top thereof being unimpeded along its entire length.

3,922,046

GARBAGE BIN HAVING MEANS FOR SUSPENDING GARBAGE SACKS WITH OPEN MOUTHS

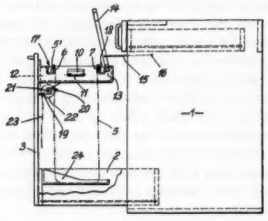
Walter Schneider, Wildenbuhlstrasse 54, 8135 Langnau am Albis (Kt. Zurich), Switzerland

Filed Oct. 29, 1973, Ser. No. 410,618

Claims priority, application Switzerland, Nov. 3, 1972, 16166/72

Int. Cl.² A47B *77/18, 81/00*

U.S. Cl. 312—211 **2 Claims**



1. A garbage bin comprising:

a cabinet provided with an upright wall opening giving access to an internal compartment;

a pull-out rack slidably mounted in said compartment for extraction from said cabinet, said rack having a vertical front panel closing said opening in a retracted position of the rack

a rectangular horizontal frame mounted on a rear surface of said front panel near the top thereof, said frame having front and rear members parallel to said surface and side members transverse thereto, said front and rear members forming upwardly open front and rear channels traversing said side members for receiving bent-over front and rear portions of the mouth of a garbage sack suspended within said frame with lateral portions of said mouth draped about said side members; and

a lid hinged to said rear member rearwardly of said rear channel for swinging about an axis above the bottom of said rear channel with flanges bracketing said side member and an edge of said front channel in a swung-down position.

3,922,047

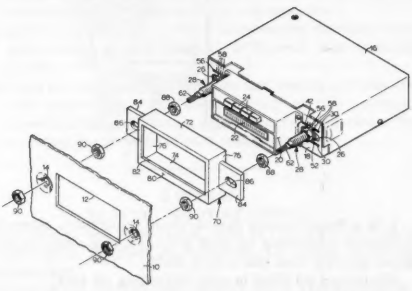
REPLACEMENT RADIO RECEIVING APPARATUS WITH ADAPTER FRAME FOR IN DASH AUTOMOTIVE INSTALLATIONS

Tom T. Tsuji, Monterey Park, Calif., assignor to J.I.L. Corporation of America, Inc., Carson, Calif.

Filed Mar. 11, 1974, Ser. No. 449,750

Int. Cl.² H05K *5/00*

U.S. Cl. 312—242 **1 Claim**



1. For use with a replacement radio receiving apparatus adapted to be mounted in an automobile instrument panel having a generally rectangular nosepiece cutout and control element apertures in recessed portions of the instrument panel bilaterally adjacent the cutout, the receiving apparatus having a faceplate and a nosepiece and control elements bilaterally adjacent the nosepiece projecting from the faceplate: a generally rectangular adapter frame for filling a gap defined by the nosepiece and the instrument panel cutout, the adapter frame including top, bottom and side walls having front extremities, a flange directed inwardly from the front extremities of the walls and defining an inner, rectangular opening adapted to receive the nosepiece in a close fit, the flange defining a front surface having an outer rectangular margin dimensioned to engage the portion of the instrument panel around the cutout, the frame further including a lug projecting laterally from each side wall, each lug having a horizontally oriented slot for receiving one of the control elements and permitting lateral adjustment thereof, each lug being attached to the side wall rearward of the front surface of the frame to provide clearance for the recessed portion of the instrument panel.

3,922,048

TOP LOCK AND LOCATOR FOR APPLIANCE

Robert W. Christianson, St. Joseph, and Else Elsner, Benton Harbor, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 24, 1974, Ser. No. 517,417

Int. Cl.³ E05C *3/00;* **A47F** *88/22;* **G07F** *1/00*

U.S. Cl. 312—284 **9 Claims**

7. In an appliance having a four-sided cabinet including upper flange portions corresponding to each of said sides, a top including lower flange portions corresponding to and facing said upper flange portions, hinge means associated with a first of said sides for hingedly fastening said top to said cabinet, and spring means affixed to the upper flange portion of a third of said cabinet sides opposite said first cabinet side for engaging a corresponding lower flange portion of said top; top lock and locating means for orienting and locking said top in place on said cabinet, said top lock and locating means comprising:

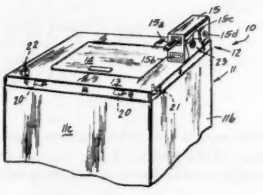
releasable fastening means associated with a second of said cabinet sides adjacent said first side for selectively secur-

ing said top to said second cabinet side to thereby restrain relative movement between said top and said cabinet;

locator means on said second cabinet side and space from said fastening means for contacting a lower flange portion of said top to locate and limit lateral movement of said top with respect to said cabinet;

a lock-locator means associated with a fourth of said cabinet sides opposite said second cabinet side for cooperating with said locator means to orient said top laterally with respect to said cabinet and for cooperating with said releasable fastening means to lock said top to said cabinet,

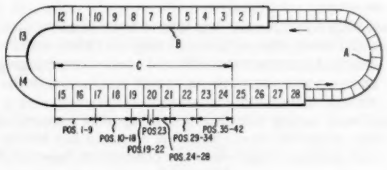
said lock-locator means including a body portion for contacting a lower flange portion of said top, a deflectable wing portion integral with said body portion and yieldable to said lower flange portion of said top in response to movement of said top toward said cabinet and engageable with said lower flange portion of said top to obstruct movement of said top away from said cabinet, and means for attaching said body portion to said cabinet.



3,922,049
METHOD OF DEGASSING A CATHODE-RAY TUBE PRIOR TO SEALING

Frank Stanley Sawicki, Scranton, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,158
Int. Cl.² H01J 9/18
U.S. Cl. 316—19 **4 Claims**



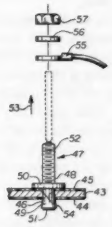
1. In a method for making a cathode-ray tube comprising an envelope and a mount assembly including at least one cathode and a heater therefor sealed in said envelope, said method including the steps of baking said envelope and mount assembly at about 300° to 450°C and simultaneously exhausting gases from said envelope and then sealing said envelope,

the steps during said baking and exhausting of said envelope comprising first (1) sequentially and then (2) simultaneously (a) applying radio-frequency energy to said mount assembly and (b) passing electric current through said heater, whereby said simultaneous application step (2) heats said mount assembly including said cathode above 450°C.

3,922,050
BLIND, SHANK EXPANDING ELECTRICAL TERMINAL STRUCTURE

Michael J. Lettini, Mercer Island, and Howard P. Stock, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 21, 1974, Ser. No. 453,200
Int. Cl.² H01R 3/06
U.S. Cl. 339—14 R **13 Claims**



1. A blind shank expanding threaded electrical grounding terminal structure:

1. a sheet of material having an electrically conductive center and covered on its first and second sides with generally non-conductive layers, said sheet of material having a cylindrical aperture therein extending through said electrically conductive center and said generally non-conductive layers whereby said electrically conductive center is exposed in the region defined by the periphery of said cylindrical aperture;
2. an integrally formed elongated shank co-axially centered in said cylindrical aperture, said elongated shank including:
   a. a head located on one end, said head adapted to cause a collar to be formed in a radially expandable sleeve on the second side of said sheet of material in bearing engagement with the non-conductive layer located on said second side;
   b. a sleeve expanding region located adjacent to said head, said sleeve expanding region adapted to radially press a radially expandable sleeve into low resistance electrical contact with the portion of said electrically conductive center exposed in the region defined by the periphery of said cylindrical aperture; and,
   c. a threaded portion extending axially outwardly from said sleeve expanding region on the opposite side thereof from said head;
3. a radially expandable sleeve mounted about said elongated shank and extending through said sheet of material so as to generally surround said sleeve expanding region, said radially expandable sleeve being in low resistance electrical contact with the portion of said electrically conductive center exposed in the region defined by the periphery of said cylindrical aperture and in low resistance electrical contact with said sleeve expanding region of said elongated shank, said radially expandable sleeve including:
   a. a pre-formed collar located in bearing, but non-electrical, engagement with the non-conductive layer located on the first side of said sheet of material; and,
   b. a cylindrical region integral with said collar, said cylindrical region surrounding said sleeve expanding region of said elongated shank and radially pressed by said sleeve expanding region into low resistance electrical contact with the portion of said electrically conductive center exposed in the region defined by the periphery of said cylindrical aperture; and,
   c. an outwardly rolled collar portion located in bearing, but non-electrical, engagement with the non-conduc-

tive layer located on the second side of said sheet of material, said outwardly rolled collar portion being formed by the head of said elongated shank pressing said sleeve outward in the region thereof lying outside of the cylindrical aperture on said second side;

4. an electrical contact, connected to an electrical conductor at least partially surrounding the part of said threaded portion of said elongated shank located adjacent to said preformed collar on the side thereof remote from the side of said pre-formed collar in bearing engagement with said sheet of material; and,

5. a nut threaded onto said threaded portion so as to press said electrical contact into low resistance electrical contact with said pre-formed collar.

9. A method of creating a threaded electrical terminal in a sheet of material having an electrically conductive center and covered on both sides with generally non-conductive layers, said method comprising the steps of:

forming a cylindrical aperture in said sheet, said cylindrical aperture formed so as to pass through said sheet and expose said electrically conductive center in the region defined by the periphery of said cylindrical aperture;

inserting into said cylindrical aperture a blind shank expanding electrical terminal, said blind shank expanding electrical terminal comprising an elongated shank threaded at one end, and a radially expandable cylindrical sleeve surrounding the other end of said shank, said shank and said sleeve formed such that axial movement of said shank with respect to said sleeve along their common axis in a predetermined direction causes said radially expandable sleeve to expand radially outwardly, said sleeve being formed of a metallic material that is electrically compatible with the electrically conductive center of said sheet of material, said sleeve having an outer diameter sized such that it is surrounded by, but spaced slightly from, said cylindrical aperture when centered in said cylindrical aperture prior to said axial movement, said sleeve including a collar having a diameter greater than the outer diameter of said sleeve surrounding the end of said sleeve nearest said threaded end of said shank, said blind shank expanding electrical terminal being inserted into said cylindrical aperture to a position such that said collar rests against one side of said sheet of material; and, causing said radially expandable sleeve to radially expand outwardly into low resistance electrical contact with said electrically conductive center of said sheet of material in the region where the cylindrical periphery of said cylindrical aperture and the adjacent peripheral surface of said sleeve meet by axially moving said elongated shank in said predetermined direction with respect to said radially expandable sleeve.

3,922,051

CONNECTOR FOR ALPHANUMERIC DISPLAY PANELS

Charles Edward Reynolds, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

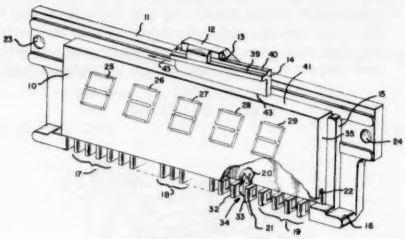
Filed Dec. 20, 1973, Ser. No. 426,748
Int. Cl.² H05K *1/00*; G09F *13/00*
U.S. Cl. 339—17 C **10 Claims**

1. The combination of a display panel, a connector for holding said display panel, and contact means between said connector and said display panel, and comprising:

said display panel having substantially rectangular major surfaces and bounded by edges of a finite thickness, with contacts being positioned along a first edge thereof;

said connector having one major surface configuration comprising first and second rib-like extensions extending outwardly therefrom and alignable with at least two adjoining edges of said display panel, and upon which said one major surface said panel display can be mounted and precisely positioned by being abutting against said two rib-like extensions;

said connector further comprising an inclined plane surface constructed to face that particular edge of said panel display which is opposite one of said adjoining edges of said display panel; and



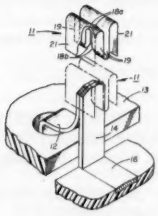
wedge-like means insertable between said inclined plane surface and the said particular edge to force said display panel against said opposite adjoining edge.

3,922,052

SNAP-ON ELECTRICAL CONNECTOR

Terrence L. Blevins, Marshalltown, Iowa, assignor to Western Electric Company, Inc., New York, N.Y.

Filed July 1, 1974, Ser. No. 485,101
Int. Cl.² H01R *7/28*
U.S. Cl. 339—19 **4 Claims**



1. An electrical connector assembly, which comprises:

a pair of adjacent electrical conductors;

a body of flexible electrically conductive material having an M-shaped configuration;

said body having center legs spaced apart in a first direction and having first sections of said electrical conductors disposed therebetween with said center legs engaging and applying gripping pressure to said conductors in the first direction; and

said body having outer legs spaced apart in a second direction perpendicular to said first direction and having second sections of said electrical conductors disposed therebetween with said outer legs engaging and applying gripping pressure to said conductors in the second direction.

3,922,053

PLUG-IN BUS DUCT

Paul M. Hafer, Florence, Ky., assignor to Arrow-Hart, Inc., Hartford, Conn.

Filed Apr. 18, 1972, Ser. No. 245,118
Int. Cl.² H01R *13/60*
U.S. Cl. 339—22 B **8 Claims**

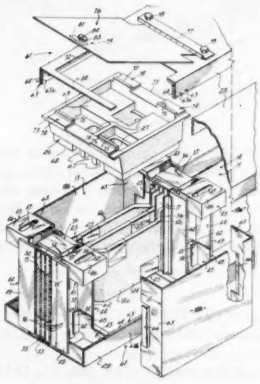
1. A plug-in bus duct comprising

a group of elongated, generally flat busbars each of which extends the length of said duct, said busbars each being made up of a plug-in section located between two sandwich sections,

an elongated housing having side walls of a height substantially greater than the width of said busbars, said side walls being comprised of individual lengths of sandwich sections and plug-in sections, and having a common top wall and common bottom wall that extend the entire bus duct length,

locator ribs fixed to said sandwich sections' side walls, said plug-in section's side walls being configured such that said walls are captured within a pocket defined by said locating ribs and said top and bottom walls and are held in position by said ribs and said top and bottom walls, thereby cooperating with said sandwich sections' side walls to provide side walls that extend the entire bus duct length,

said busbars being laterally spaced one from the other and from the sides of the housing in the plug-in section to provide sufficient space to allow engagement of a plug



unit's stabs with the busbars, and being positioned in side-by-side relation in the sandwich sections,

insulator means within said sandwich sections that is of a thickness substantially less than the thickness of said busbars disposed between said busbars and the sides of said housing, said insulator means separating said busbars one from the other and from the sides of said housing,

structure defining a stab access opening in at least one of the top and bottom walls of said housing, said stab access opening communicating with said plug-in section, and

an insulator template within said plug-in section that is interposed between said stab access opening and said busbars, said template defining a series of stab holes insulated one from the other such that each hole can receive one stab from the plug unit through said stab access opening in electrical contact with the exposed portion of a busbar.

3,922,054

PRINTED CIRCUIT ELECTRICAL CONNECTOR

Helen Dechelette, Saint Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 6, 1974, Ser. No. 503,907

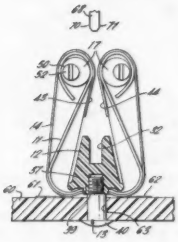
Claims priority, application France, Sept. 14, 1973, 73.33108

Int. Cl.[2] H01R *13/54;* **H05K** *1/07*

U.S. Cl. 339—75 MP **7 Claims**

1. An electrical connector for connecting conductors on a printed circuit mother board to conductors on a printed circuit daughter board, the connector comprising a generally U-shaped spring having a bight portion and a mouth portion connected by arms, a separate endless flat flexible circuit wound round the U-shaped spring, said circuit covering substantially the entire inner and outer periphery of said spring,

a retaining member for holding the circuit taut against the spring, said retaining member being secured to the bight of the spring along an inside surface of said spring, said circuit having spaced conductors extending from the portion of the circuit covering the mouth of the spring to the portion of the circuit covering the outer periphery of the bight of the spring,



said mouth of the spring being for receiving the daughter board and the bight of the spring being for mounting on the mother board whereby conductors on the mother board are connected to conductors on the daughter board by the conductors on the flexible circuit, and means for mounting the bight of the spring and thereby the connector on the mother board.

3,922,055

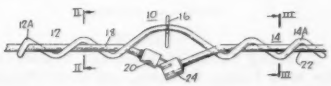
ELECTRICAL DEVICE

Clifford A. McGregor, Elsie, Nebr., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Oct. 25, 1974, Ser. No. 517,888

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—105 **4 Claims**



1. A device for enabling a male connector secured to a first electrical cable to be engaged to a female connector secured to a second electrical cable in such manner as to prevent the connectors from accidentally being separated, said device comprising:

a rigid elongated rod-like member having a mid-section region with first and second opposite end regions, said end regions each defining a coil-like structure with several turns, the first cable being placed removably in the turns of one end region, the second cable being placed removably in the turns of the other end region, the engaged connectors being disposed adjacent the mid-section region.

3,922,056
MOUNTING ARRANGEMENT FOR INTERFERENCE SUPPRESSION AND SHIELDING A MULTIPLICITY OF ELECTRICAL LINES

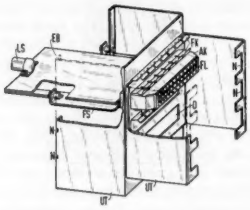
Kurt Murawski; Rolf Hagen; Claus-Peter Heitzig, all of Munich, and Jurgen Weiss, Unterhaching, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,267

Claims priority, application Germany, Sept. 28, 1972, 2247681

Int. Cl.² H01R *23/06*

U.S. Cl. 339—143 R **3 Claims**



1. A mounting arrangement for providing interference suppression in a multiplicity of electrical lines and for facilitating the connection of said electrical lines through a shielding wall, comprising:

a shielding wall having at least an opening therein,

electrical lines,

at least one electrical component supporting module having electrical interference suppressing electrical components mounted thereon, said components having inputs electrically connected to said electrical lines and output terminals,

said module including means defining an electrically shielded area having an opening therein at an end of said module,

connector means joined to said module and connected to said output terminals of said components over lines extending through said shielded area,

screen cover means closing said opening in said end of said shielded area and enclosing said connector means,

said screen cover means having dimensions forming to those of said opening in said shielding wall so as to permit insertion of said screen cover means and thereby said module.

3,922,057
CARRIER STRIP FED SOCKET TERMINAL

Timothy Allen Lemke, Dillsburg, and David Francis Fusselman, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 23, 1974, Ser. No. 463,229

Int. Cl.² H01R *13/12*

U.S. Cl. 339—258 P **5 Claims**

1. A socket terminal, comprising:

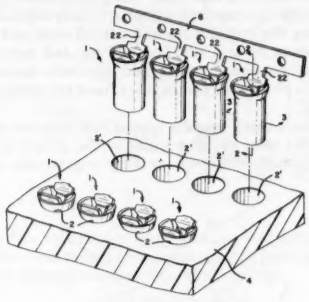
an outer metal enclosing container means having at least one enlarged open end defined by an encircling and outwardly flared lip,

an electrical receptacle in said container means defined by a pair of opposed elongated spring arms intersecting and integral with each other at respective first ends,

a pair of tab portions integral with said intersecting ends of said spring arms and projecting outwardly of said receptacle but within the confines of said container means,

said tabs having free ends engaging and secured to said lip of said container means suspending said receptacle within said container means,

said opposed spring arms forming generally a U-shaped receptacle and converging toward second free ends thereof and defining a reduced throat for said receptacle within and adjacent said encircling lip of said container, said second free ends outwardly diverging from said throat defining a funnel entry at said throat,



said second free ends being widened to define enlarged surface target areas at said funnel entry, and

said outwardly diverging second free ends overlying and in spaced relationship from said outwardly flared lip of said container means, whereby said spring arms are capable of resilient cantilever deflection away from each other.

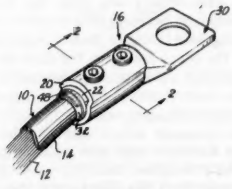
3,922,058
ELECTRICAL CONNECTOR

Joseph D. Kinnear, 3019 E. Eight Mile Road, Warren, Mich. 48091

Continuation of Ser. No. 273,691, July 21, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 457,108

Int. Cl.² H01R *7/14*

U.S. Cl. 339—272 R **7 Claims**



1. An electrical connector comprising a tubular element formed as a metal strap having overlapped end portions, said overlapped end portions defining generally concentric, circular segments which are disposed in face-to-face contacting relation through an arcuate extent at least about 120°, the center of curvature of said circular segments corresponding generally to the central axis of the tubular member, said overlapped portions being provided with a radially extending opening therethrough disposed centrally between the ends thereof, said opening having a thread extending continuously through said overlapped portions, a metal clamping screw threaded through said opening and adapted when tightened to clamp a stranded electrical conductor within the tubular element, said threaded opening having a diameter at least as large as the radius of curvature of the contacting faces of said overlapped end portions so that the axial extent of the threads on diametrically opposite sides of the threaded opening in a direction circumferentially of said overlapped ends is substantially greater than the radial thickness of said overlapped end portions whereby, when a stranded conductor sized to sub-

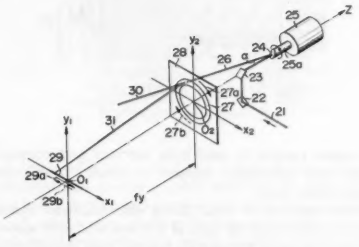
stantially completely fill said tubular element is inserted therein and the screw is tightened, said two overlapped end portions are tensioned circumferentially in opposite directions along the arcuate path of said circular segments when the leading end of the screw bottoms on the conductor and thereby tightly interengage said diametrically opposite sides of said threaded opening substantially throughout their axial extent with the juxtaposed threads of the screw.

3,922,059

METHOD OF CONVERTING CIRCULAR SCANNING LINES INTO LINEAR SCANNING LINES

Masaru Noguchi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 3, 1974, Ser. No. 511,652
Claims priority, application Japan, Oct. 4, 1973, 48-111770
Int. Cl.² G03H *1/04*; G02B *5/32*
U.S. Cl. 350—3.5 **5 Claims**



1. A method of forming a linear scanning line on a plane comprising steps of

preparing a hologram which vertically converges a conically diverging beam having an annular cross section incident thereto to make it converge to a straight horizontal line on a plane separated from the hologram by a predetermined distance,

producing a collimated coherent light beam,

directing said coherent light beam to a circular scanning means including a beam deflecting means which deflects the light beam incident to a point therein to make it advance from said point in diverging directions and form a circular scanning line on a plane faced normally to the beam deflecting means, and

forming a circular scanning line by said beam deflecting means on said hologram,

thereby forming a linear scanning line on a plane separated from the hologram by said predetermined distance.

3,922,060

HOLOGRAM RECORDING DEVICE

Shigenori Oosaka; Masaru Noguchi, and Tsunehiko Takahashi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed May 6, 1974, Ser. No. 467,540
Claims priority, application Japan, May 8, 1973, 48-50902
Int. Cl.² G03H *1/30*; G02B *5/32*
U.S. Cl. 350—3.5 **1 Claim**

1. A hologram recording device for recording a plurality of elemental holograms along the circular periphery of a disc of planar hologram recording material, said device comprising:

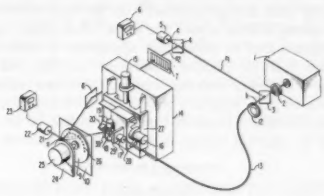
a laser light source;

a beam splitter for splitting a laser light beam from the laser light source into a first laser light beam and a second laser light beam;

means for directing said first laser light beam in a fixed predetermined direction onto said hologram recording material at a single predetermined point in the plane of said recording material;

a mirror mounted in a gimbal for rotation about two orthogonal axes, the gimbaled mirror being mounted on a platform mounted for translational movement along two orthogonal directions in a plane;

an optical fiber having two ends, one end fixedly mounted for receiving said second laser light beam and the other end fixedly mounted on said platform for directing said second laser light beam to said gimbaled mirror;



means for rotating said hologram recording material to a plurality of angular orientations, separated by equal angular displacements, in the plane of said hologram recording material, each orientation providing a unique recording location for one elemental hologram; and

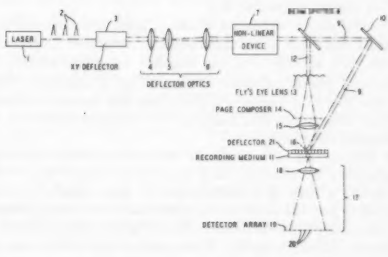
means for translating and platform to a different position for each elemental hologram and for rotating said mirror to an orientation such that said second laser light beam is directed to said predetermined point to intersect and interfere with said first laser light beam.

3,922,061

OPTICAL STORAGE APPARATUS AND PROCESS

Alastair Malcolm Glass, Millington, and Dietrich von der Linde, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 10, 1974, Ser. No. 477,836
Int. Cl.² G03H *1/02*, *1/04*
U.S. Cl. 350—3.5 **14 Claims**



1. Holographic storage apparatus comprising a body of electrically polarizable material together with writing means for introducing information into said medium and reading means for extracting such information, in which said writing means comprises first means for generating an information-containing beam of radiation incident on said medium at some angle and a second means for introducing a non-information-containing beam of radiation so that interference between beams produced by said first and second means within said medium said first and second means being such that resulting radiation in each means contains at least a component of the same wavelength producing a corresponding interfering radiation pattern within said medium thereby producing a variation in refractive index corresponding with such pattern within the said medium and in which the said reading means is modulated in accordance with such varying refractive index pattern,

characterized in that the photon energy of the radiation produced by the said writing and reading means is within the bandgap of the said medium, in that the said writing means includes a third means for producing non-information-containing radiation on at least a portion of the said body upon which the beam of at least the said first means is incident, the radiation of the third means also being of a photon energy within the bandgap of the said medium but being sufficient such that when combined with the radiation of the said first means the total energy produced by multiple photon is sufficient to attain a level above the upper absorption edge of the said medium and in which the apparatus is such that total maximum multiple photon absorption corresponds with absorption of radiation produced by said first and second means in regions of peak intensity within the medium by an amount which significantly exceeds that attributable to any real absorption for photon energy of said first and second means.

3,922,062

INTEGRALLY FORMED OPTICAL CIRCUIT WITH GRADIENT REFRACTIVE INDEX

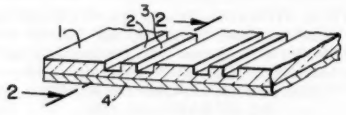
Teiji Uchida, Tokyo, Japan, assignor to Nippon Electric Co., Inc., Tokyo, Japan

Division of Ser. No. 292,305, Sept. 26, 1972, Pat. No. 3,817,730, which is a continuation-in-part of Ser. No. 101,743, Dec. 28, 1970, abandoned. This application June 20, 1973, Ser. No. 371,597

Claims priority, application Japan, Dec. 29, 1969, 44-105247

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 WG **3 Claims**



1. An integrally formed optical circuit comprising:

a first planar substrate; and

a second planar substrate made of glass and containing at least one type of metallic positive ions, and attached to the first substrate in the manner of a lamination, the second planar substrate having a higher refractive index than the first whereby light within the second substrate that strikes the first substrate is reflected back into the second substrate;

the unattached surface of the second substrate defining a plurality of channels and interstitial ridges, each ridge having a varying concentration of said metallic positive ions to provide a refractive index that decreases gradually outwardly from its center axis toward its free surfaces to form a discrete optical transmission line for connecting optical components and through which light can be projected.

3,922,063

WINCH MOUNTED OPTICAL DATA TRANSMISSION CABLE WITH FLUID COUPLING

Frederick A. Marrone, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,532

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **5 Claims**

1. An oceanographic winch for handling optical data transmission cable comprising:

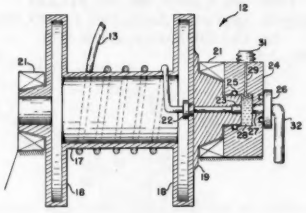
a base member for attachment to a marine vessel;

a cylindrical support rotatably journaled in said support member;

an optical data transmission cable spoolably wound upon said cylindrical support for selectively paying-out therefrom and reeving-in thereon;

a rotatable optical window axially mounted on said cylindrical support for rotation therewith and optically connected to said optical data transmission cable as a terminal therefor;

a stationary optical window mounted on said base member positioned closely adjacent and in spaced relation to said rotatable optical window to provide an enclosed space therebetween and to pass optical data signals transmitted by said optical data transmission cable through said rotatable optical window;



seal means carried by said base member and cooperating with said cylindrical support to render said enclosed space fluid tight;

optically transparent fluid filling said enclosed space between said rotatable optical window and said stationary window so as to provide an optical path therebetween;

a channel extending through said base member from said enclosed space to the exterior of said base member; and

optical means operatively connected to said stationary optical window for cooperation therewith in transmission of the optical signals and, thus, permit optical signal transmission along a variable length communication path in dependence on the length of optical data transmission cable unwound from said cylindrical support.

3,922,064

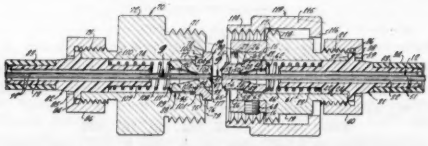
SELF-ALIGNING OPTICAL WAVEGUIDE CONNECTOR

Kenneth M. Clark, Beaumont, and Marc W. Maisby, Lake Arrowhead, both of Calif., assignors to The Deutsch Company Electronic Components Division, Banning, Calif.

Filed Nov. 11, 1974, Ser. No. 522,893

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96 C **11 Claims**



1. An optical waveguide connector comprising

a first optical waveguide means having an end portion,

a first support means for said end portion of said first optical waveguide means,

said first support means including a convex surface of revolution coaxial with said first optical waveguide means,

a second optical waveguide means having an end portion,

a second support means for said end portion of said second optical waveguide means,

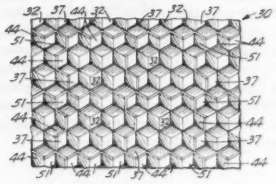
said second support means including a concave surface of revolution coaxial with said second optical waveguide means;

and means urging said first and second support means relatively toward each other for causing an interengagement of said convex and concave surfaces and thereby aligning said first and second waveguide means.

3,922,065
CUBE-CORNER RETRO-REFLECTIVE ARTICLE

Thomas E. Schultz, Village of Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 749,239, May 31, 1968, abandoned, which is a division of Ser. No. 593,948, Nov. 14, 1966, Pat. No. 3,417,959. This application Feb. 19, 1971, Ser. No. 117,035
Int. Cl.² G02B 5/12
U.S. Cl. 350—103 **7 Claims**

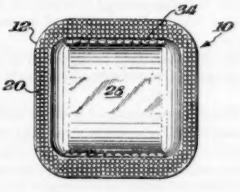


1. A retro-reflective monolithic article formed of transparent material and having a front and rear surface, the front surface being smooth and the rear surface having a continuous array of cube-corner retro-reflective units, said array being divided by intersecting septa into a plurality of separate cells, each said cell containing a plurality of said units, and said septa having rear edges forming a continuous securable rear edge, characterized in that said array is formed as a surface of continuous contiguous rearwardly projecting cube-corner units each having a rearwardly positioned apex formed by three rectangular mutually perpendicular rearwardly converging facets forming three rearwardly converging dihedral edges, and said septa are formed as continuous intersecting walls extending rearward from a portion of at least one of said facets forming said dihedral edges, having a width less than a dimension of said facet, and directionally along the shortest path defined by said dihedral edges connecting apexes of adjacent units whereby said septa minimize the loss in retroreflectivity afforded by said facets from which said septa extend.

3,922,066
REFLECTIVE ROADWAY MARKER

Howard A. Schaefer, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Continuation-in-part of Ser. No. 296,947, Oct. 12, 1972, Pat. No. 3,877,785. This application Aug. 1, 1974, Ser. No. 493,927. The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.
Int. Cl.² G02B 5/126
U.S. Cl. 350—104 **20 Claims**

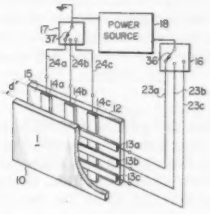


1. A retroreflective roadway marker comprising a body member, said body member having a peripheral rim and having top and side walls, said body member being of internally dished-out construction thereby forming an internal cavity exposed at its bottom wall, a retroreflective optical system in at least one side wall of said body member, the optics containing side wall being inclined upwardly and inwardly, said body member, and its optical system being integral and made of tempered glass to provide improved impact strength and to disintegrate into harmless particles upon failure, said optical system including an externally disposed lens surface and an internally disposed reflective surface associated therewith, each of said lens surface and said reflective surface having a radius of curvature, and the ratio of the radius of curvature of said reflective surface to the radius of curvature of said lens surface being substantially equal to the index of refraction of the glass used for the material of said optical system.

3,922,067
ELECTRO-OPTICAL DISPLAY DEVICE INCLUDING AN IMPROVED LIQUID CRYSTAL COMPOSITION

Kenji Murao; Kazuhisa Toriyama, both of Hitachi; Norimasa Kamezawa, Ibaraki, and Teruo Kitamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 22, 1974, Ser. No. 444,742
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **27 Claims**



1. In an electro-optical display device comprising a nematic liquid crystal capable of effecting dynamic scattering; means for supporting said liquid crystal layer; a plurality of first electrode means for applying a pulse electric field to said liquid crystal layer, said liquid crystal layer being divided thereby into a plurality of segments; second electrode means for applying a pulse electric field to said liquid crystal layer, the second electrode means being positioned opposite to the first electrode means, the liquid crystal layer being sandwiched between the first electrode means and the second electrode means; and means for applying a pulse electric field through the first and second electrode means to the segments of the liquid layer by multiplexing, the improvement comprising the liquid crystal layer containing an effective amount of at least one polyhalide of an organic quaternary nitrogen compound in which the halogen atoms are selected from the group consisting of chlorine, bromine and iodine to enhance the dynamic scattering motion of said liquid crystal layer.

3,922,068
MULTI-LAYER ANTI-REFLECTION COATING WITH HIGH AND LOW INDEX MATERIAL

Toshio Uetsuki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

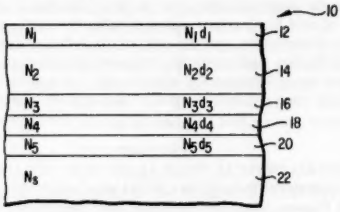
Filed June 17, 1974, Ser. No. 480,288
Claims priority, application Japan, June 18, 1973, 48-68547
Int. Cl.² G02B 5/28
U.S. Cl. 350—164 **13 Claims**

12. A five layered anti-reflection coating for use with an optical substrate having an index of refraction in the range of 1.42 to 1.90 to provide a low, relatively constant reflectance of light across the central region of the visual spectrum with

only two separate coating materials of a high and low refractive index comprising:

a first layer furtherest from the substrate having an optical thickness, of approximately ¼ design wavelength and a low index of refraction in the range of 1.35 to 1.62;

a second layer having an optical thickness greater than ½ design wavelength and a high index of refraction in the range of 1.95 to 2.35;



a third layer having the same index of refraction as the first layer and an optical thickness of less than ¼ design wavelength;

a fourth layer having the same index of refraction as the second layer and an optical thickness of less than ¼ design wavelength, and;

a fifth layer having the same index of refraction as the first layer and an optical thickness of less than 0.225 the design wavelength, wherein the design wavelength is preselected between 400 and 700 nanometers.

3,922,069

COLOR SEPARATING PRISM SYSTEM

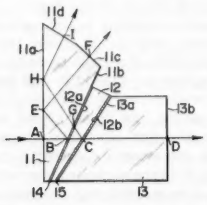
Toshiro Kishikawa; Kazuo Yoshikawa; Toshiro Yamauchi, all of Omiya, and Takeshi Higuchi, Tokyo, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Mar. 21, 1974, Ser. No. 453,439

Claims priority, application Japan, Apr. 9, 1973, 48-40241

Int. Cl.² G02B *27/14*

U.S. Cl. 350—173 **12 Claims**



1. A color separating prism system adapted to be used for a color television camera having a non-reflecting optical axis consisting of a single totally reflecting surface and comprising:

a first prism block having an entrance face extending across said non-reflecting optical axis, a first emanting face extending across said non-reflecting optical axis behind said entrance face and being inclined in one direction at an angle with respect to a plane parallel to said entrance face, and a second emanating face extending across said entrance face and said first emanating face for transmitting light rays reflected by said entrance face, said single totally reflecting surface being located on the rear of said entrance face and presented toward said first and second emanating faces;

a second prism block having an entrance face and an emanating face both extending across said non-reflecting optical axis;

a third prism block having an entrance face extending across said non-reflecting optical axis and being inclined in the same direction as that of said first emanating face of the first prism block at an angle with respect to the plane parallel to said entrance face, and an emanating face extending across the non-reflecting optical axis behind said entrance face thereof;

a first dichroic layer which reflects a first color light component and transmits the remainder; and

a second dichroic layer which reflects another color light component contained in said remainder transmitting through the first dichroic layer and transmits the remainder;

said first dichroic layer being interposed in direct contact between said first emanating face of the first prism block and said entrance face of the second prism block without any air gap therebetween, said second dichroic layer being interposed in direct contact with said emanating face of the second prism block and said entrance face of the third prism block without any air gap therebetween; said first emanating face of the first prism block and said entrance face of the third prism block being so inclined that light rays reflected by the dichroic layers are reflected toward said single totally reflecting surface so that said light rays are totally reflected by said single totally reflecting surface located on the rear of said entrance face of the first prism block and emanate through said second emanating face thereof.

3,922,070

HIGH-SPEED VARIFOCAL OBJECTIVE

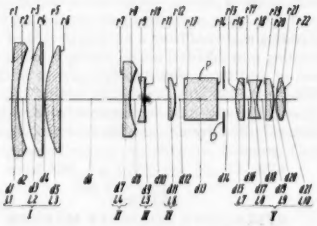
Karl Macher, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Rhineland, Germany

Filed Oct. 9, 1974, Ser. No. 513,257

Claims priority, application Germany, Oct. 10, 1973, 2350829

Int. Cl.² G02B *15/16*

U.S. Cl. 350—184 **6 Claims**



1. A varifocal objective comprising an afocal front lens group of adjustable focal length and a rear lens group of fixed focal length, said front lens group consisting of:

a substantially fixed first component of positive individual focal length f_I with a negatively refracting first lens member, a positively refracting second lens member and a positively refracting third lens member;

an axially shiftable second component of negative individual focal length f_{II} constituted by a single fourth lens member;

an axially shiftable third component of negative individual focal length f_{III} constituted by a single forth lens member; and

a fixed fourth component of positive individual focal length f_{IV} constituted by a single sixth lens member;

the individual focal lengths of said components being related to said fixed focal length f_V substantially as follows:

$$f_I/f_V = +3.1$$
$$f_{II}/f_V = -1.6$$
$$f_{III}/f_V = -1.9$$
$$f_{IV}/f_V = +2.0.$$

3,922,071
SYMMETRICAL OBJECTIVE

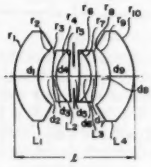
Masamichi Kitagawa, Hino, and Minoru Yokota, Isehara, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1973, Ser. No. 390,510

Claims priority, application Japan, Aug. 29, 1972, 47-85876; Aug. 29, 1972, 47-85877

Int. Cl.² G02B 9/34, 9/62

U.S. Cl. 350—215 **3 Claims**



1. A symmetrical objective comprising front and back lens groups symmetrically arranged on opposite sides of a stop, the front lens group consisting of a first lens group having a front surface convex toward an object with meniscus form and a second cemented positive lens group having a front surface convex toward the object and rearwardly spaced from the first lens group, the back lens group consisting of a third lens group and a fourth lens group, the third lens group being between the stop and the fourth lens group, said back lens group having a symmetrical arrangement and configurations with the front lens group with respect to the stop; said first lens group consisting of a first lens element, said second lens group consisting of a second lens element and a third lens element rearwardly cemented to the second lens element, said third lens group consisting of a fourth lens element and a fifth lens element rearwardly cemented to the fourth lens element, said fourth lens group consisting of a sixth lens element, said objective having an equivalent focal length of 1.0 decimeter when constructed according to the following parameters:

Element No.	N	V	Radius Decimeter	Axial Thickness or Air Space Decimeter
			$r_1 = 0.2036$	
1	1.65844	50.9		d_1=0.0986
			$r_2 = 0.1684$	
				d_2=0.0258
			$r_3 = 0.3214$	
2	1.53172	48.9		d_3=0.0138
			$r_4 = 0.1162$	
3	1.49388	66.1		d_4=0.0390
			$r_5 = 0.7762$	
				d_5=0.0355
			$r_6 = -0.7762$	
4	1.49388	66.1		d_6=0.0390
			$r_7 = -0.1162$	
5	1.53172	=48.9		d_7=0.0138
			$r_8 = -0.3214$	
				d_8=0.0258
			$r_9 = -0.1684$	
6	1.65844	50.9		d_9=0.0986
			$r_{10} = -0.2036$	

wherein N and V are respectively refractive indices and Abbe numbers, Radii are numbered from r_1 to r_{10}, the axial glass thickness and axial air space are successively numbered d_1 to d_9.

3,922,072
BIOCULAR MAGNIFYING LENSES

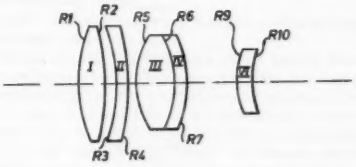
Philip John Rogers, Prestatyn, Wales, assignor to Pilkington P. E. Limited, Wales

Continuation-in-part of Ser. No. 329,390, Feb. 5, 1973, abandoned. This application Aug. 15, 1974, Ser. No. 497,694

Claims priority, application United Kingdom, Feb. 17, 1972, 7510/72

Int. Cl.² G02B 25/00

U.S. Cl. 350—220 **19 Claims**



1. A biocular magnifying lens faster than f/1.0 having a front part, a middle part, and a back part, the front part being convergent and having a focal length between +3F and +12F, where F is the focal length of the complete lens, the middle part being convergent and having a focal length between +1.6F and +2F, there being a divergent element included in at least one of the front and middle parts, and the back part being convergent and having a focal length between +1F and +1.75F, the back part comprising a component convex towards the front, and in which lens spherical aberration introduced by convergent elements is corrected by at least one front surface of at least one divergent element included in at least one of the front and middle parts, astigmatism is controlled by the spacing between the middle and back parts, and the parts are arranged to effect coma correction.

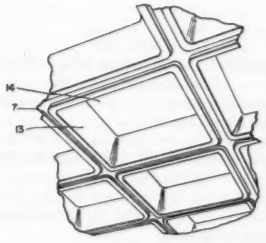
3,922,073
LIGHT DIFFUSER SYSTEM

Robert A. D. Schwartz, 513 Independent Road, Oakland, Calif. 94621

Filed Apr. 25, 1973, Ser. No. 354,348

Int. Cl.² G02B 5/00; F21V 5/00

U.S. Cl. 350—319 **13 Claims**



1. Light diffusing means for a ceiling with a light source above comprising: a unitary member having side walls joined to a laterally extending top planar wall and defining a downwardly directed cavity, said top planar wall being translucent for the passage of light from the light source therethrough, and said side walls being translucent; and opaque means substantially completely covering at least one of the inside and outside surfaces of all said side walls for preventing passage of light through said side walls and reflecting incident light passing through said top wall.

3,922,074
INFORMATION STORAGE AND RETRIEVAL

Yoshizo Ikegami, Nishinomiya, and Akio Miyauchi, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 24, 1973, Ser. No. 399,898
Claims priority, application Japan, Sept. 25, 1972, 47-95900
Int. Cl.² G09C *5/00*
U.S. Cl. 350—320 **2 Claims**

1. A method of information handling including producing an element having camouflaged information recorded thereon which comprises:

a first recording through an information transformation medium comprising a lenticular plate having truncated semi-conical lenses with a common projected apex, of first information from an information-carrying medium onto a recording element comprising a photosensitive or electrophotosensitive element, said information-carrying medium, said information transformation medium and said recording element being positioned relative to each other in a first spatial configuration,

a second recording through said information transformation medium of camouflaging or noise information from said information-carrying medium onto said recording element, said information-carrying medium, said information transformation medium and said recording element for said recording being positioned relative to each other in a second spatial configuration achieved by rotating said lenticular plate around the common projected apex to a position different than on said first spatial position, and wherein,

an image-forming optical system is interposed between said information-carrying medium and said information transformation medium during said first and second recordings.

3,922,075
SYNCHRONIZING SYSTEM FOR RECORDING VISUAL IMAGES AND SOUND

John Frank Castagna, Brooklyn, N.Y., assignor to Optasound Corporation, New York, N.Y.

Continuation of Ser. No. 181,313, Sept. 17, 1971, abandoned. This application July 28, 1972, Ser. No. 275,920
Int. Cl.² G03B *31/04*
U.S. Cl. 352—16 **12 Claims**

1. Apparatus for synchronizing the recording of visual images and sound comprising:

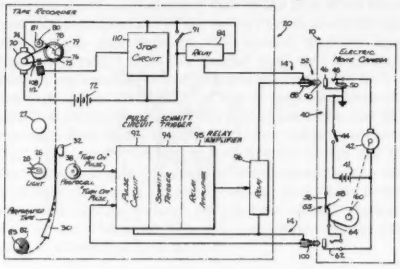
an electrically powered motion picture camera having a camera motor, a first source of electrical energy and a manually actuable first control switch,

a tape recorder including means for holding a recording tape, a tape recorder motor adapted to move whatever tape is held therein, a second source of electrical energy, and a second control switch, said second control switch being responsive to the actuation of said manually actuable first contol switch of said camera to turn on said tape recorder motor and cause movement of said tape,

a sensing unit responsive to the movement of tape moved by said tape recorder motor to generate a turn-on electrical signal in response to each passage of a predetermined length of tape,

bistable switching means having a first state and a second state, said bistable switching mens being responsive to said turn-on signal to be switched into said first state in response thereto,

a third control switch having an on-state and an off-state, said third control switch turning on said camera motor when in said on-state, said third control switch being responsive to the state of said bistable switching means to



be turned on in response to said first state of the bistable switching means and to be turned off in response to said second state of said bistable switching means,

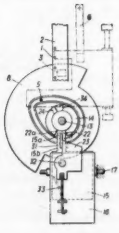
an automatic control switch in said camera to generate a turn-off electrical signal in response to each passage of a predetermined length of film,

said bistable switching means being responsive to said camera turn-off signal to be switched into its second state in response thereto, thereby switching said third control switch into its off-state and turning off said motor of said camera.

3,922,076
MOTION PICTURE CAMERA

Josef Schild, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Nov. 20, 1974, Ser. No. 525,647
Claims priority, application Austria, Nov. 26, 1973, 9875/73
Int. Cl.² G03B *21/38*
U.S. Cl. 352—169 **6 Claims**



1. A shutter control means for a camera comprising:

a rotatable shutter;

a stop face means connected to said shutter, comprising a first and second stop faces;

a release means comprising first and second counter stop faces positioned to engage said first and second stop faces to respectively close and open said shutter;

a rotatably switchable drive mechanism, connected to the shutter to rotate same in both the clockwise and the counter-clockwise direction comprising a switch means for activating said drive mechanism, said switch means being controlled by said release means so that said drive

mechanism is inoperative when said first stop face is in engagement with said first counter stop face; and

a delay-time switch for controlling said drive mechanism comprising a normal mode system wherein said drive mechanism is driven in a first direction so that said shutter rotates continuously and a delayed time exposure system wherein said drive mechanism is rotated in the opposite direction until said second stop face engages said second counter stop face to open said shutter, said shutter remaining open until a timing device of said time exposure system causes said time exposure system to reswitch so that after a given time, said drive mechanism is rotated in said first direction until said first stop face engages said first counter stop face to thereby close said shutter.

3,922,077

CINEMATOGRAPHIC PROJECTOR

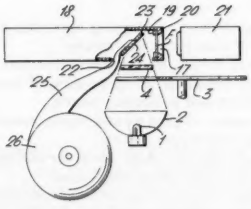
Jean A. Thévenaz, Grandson, Switzerland, assignor to Bolex International SA, Ste. Croix, Switzerland

Continuation-in-part of Ser. No. 293,150, Sept. 28, 1972. This application Mar. 25, 1974, Ser. No. 454,299

Claims priority, application Switzerland, Sept. 27, 1971, 14147

Int. Cl.² G03B 9/10

U.S. Cl. 352—202 **1 Claim**



1. A cinematographic projector having a light source, means for advancing the cinematographic film in front of the film gate and a lens to diffuse the light and infra-red rays from said light source in an irregular pattern so that the intensity of these rays in the central region of each film frame would be stronger than that on the outer regions thereof, said projector further comprising control means arranged to intercept the central light and infra-red rays during film advance type projection and still projection for changing said irregular intensity pattern in such a manner that the maximum of intensity is displaced from the central region of each film frame to the outer regions thereof, and wherein said control means comprises a mirror positioned to reflect the light and infra-red rays from the source towards the film gate, said mirror reflecting surface having an opening in its central region to reflect a greater intensity of light and infra-red rays at its outer regions than at its central region, and said projector further comprising means for forcing air through said mirror opening directly on to the central region of the film frame.

3,922,078

EQUIPMENT TO SYNCHRONIZE PICTURES WITH SOUNDS

Masanori Uchidoi, Kawasaki, and Yoshihiro Shigeta, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 4, 1973, Ser. No. 393,920

Claims priority, application Japan, Sept. 5, 1972, 47-88847

Int. Cl.² G03B 31/04

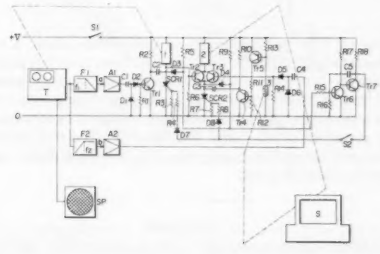
U.S. Cl. 353—15 **33 Claims**

1. Equipment for use in combination with a visual display device, a sound information recording and playback device, sound information recording media, and image information recording media for synchronizing the image information of the image information recording media with sound information of the sound information recording media, said image information recording media being displayed by the visual display device and said sound information recording media being reproduced by the recording and playback device, said equipment comprising;

said image information recording media having a plurality of frames of image information, and being provided with a mark for synchronization corresponding to every Nth frame of said image information on said image information recording media;

means for detecting said mark and for producing a signal when said mark is detected;

said sound information recording media having first and second signals being stored thereon, said first signal for compensating for the delay of synchronization between said image information and said sound information and being stored in a position corresponding to the frame on which said mark of said image information recording media appears, said second signal for changing said image



information frame-by-frame and being stored in a position corresponding to each frame of said image information;

first means responsive to said first signal and being operatively connected to said recording and playback device for permitting continued operation of said device and for stopping operation of said device;

second means responsive to said second signal and said signal produced by said detecting means and operatively connected to said visual display device for permitting continued operation of said device, said means operating so as to change said visual display device so that image information is regularly changed and simultaneously being capable of operating on said visual display device irrespective of said second signal to change said image information without correspondence to said sound information, the action of said second means being stopped in accordance with the signal from said detecting means; and

an actuating means operatively connected to said first and second means for starting said first and second means when said first and second means jointly stop their action.

3,922,079

OPTICAL MULTIPLE PROJECTOR

Jan-Erik Astero, Tumba, Sweden, assignor to Lindaco Ltd., Switzerland

Filed Sept. 7, 1973, Ser. No. 395,134

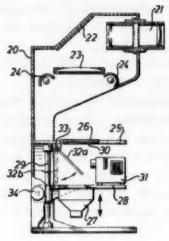
Claims priority, application Sweden, Sept. 12, 1972, 11778

Int. Cl.² G03B 21/08, 21/20

U.S. Cl. 353—63 **1 Claim**

1. Projection apparatus of the overhead type, comprising a TV-set having a picture tube surface arranged horizontally, a mirror positioned above said picture tube surface, for deflecting light from said picture tube surface, and a lens system for

projecting the image of the picture tube surface onto a screen, said projector including a table, said TV-set being normally positioned below said table, mounted on a support, said table at its top side being provided with a frosted sheet of transparent material for the transmission of opaque pictures and full size transparencies through said lens system, light means for illuminating said frosted sheet from a position above said surface, a film projector or diascopic projector arranged to



create an intermediate image on said frosted sheet, a mirror being arranged for deflecting the light from said film projector or diascopic projector to provide said intermediate image on said frosted sheet, said intermediate image being projected on said screen through said lens system, means for supporting the film projector or diascopic projector in a position below the table, and means for moving the TV-set to a position remote from the frosted sheet.

3,922,080

PROJECTION APPARATUS USING ADDITIVE MIXTURE OF COLORS

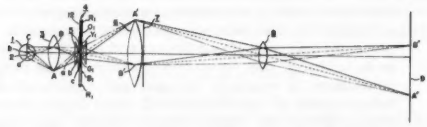
Akira Kodama, Murayama; Mamoru Yaegashi, and Shoichi Nishida, both of Toyota, all of Japan, assignors to Zaidanhojin Nippon Shikisai Kenkyusho, Tokyo and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed July 24, 1973, Ser. No. 382,158

Claims priority, application Japan, Dec. 23, 1972, 47-1011

Int. Cl.² G03B *33/06, 21/00*

U.S. Cl. 353—84 **7 Claims**



1. A projection apparatus using an additive mixture of colors comprising a lamp serving as a light source, a first condenser lens arranged in a position in front of the light source for collecting light emanating from said lamp and forming an image of a filament of the lamp in an arrea in front of the lens, a color mixing filter assembly disposed in a position in which said image of said filament of said lamp is formed by said first condenser lens, said color mixing filter assembly comprising a plurality of filter elements different in hue from one another and each varying in saturation gradually from one end thereof to the other and arranged whereby the hue is varied in the order of the wavelengths when said filter elements are moved in a direction normal to that direction in which the saturation of the filter element is varied, a second condenser lens arranged in a color mixing zone disposed forwardly of the assembly for collecting light colored by said filter assembly, a slide disposed in a forward position in the vicinity of said second condenser lens, and a projection lens disposed forwardly of the slide for projecting an image of said slide onto a screen disposed forwardly of said projection lens.

3,922,081

SLIDE PROJECTION OVERLAPPING APPARATUS

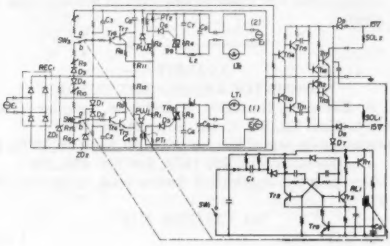
Masanori Uchidoi, Yokohama, and Tateo Yamada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1973, Ser. No. 413,661

Claims priority, application Japan, Nov. 11, 1972, 47-129977

Int. Cl.² G03B *23/16*

U.S. Cl. 353—86 **5 Claims**



1. A slide projection overlapping apparatus comprising:

a plurality of slide projecting means;

power supply means for providing currents to said slide projecting means for the generation of luminous energy outputs from said projecting means;

switching means coupled to said supply means for opening or closing said supply means;

means for generating a pulse signal for shifting the connections between said projecting means;

switch control means for selectively controlling the operation of said switching means in response to pulse signal generating means;

voltage control means coupled to said supply means for varying the levels of illumination of said projecting means, said voltage control means being responsive to the application of a voltage thereto from a power supply source to cause the voltages controlled by said voltage control means to linearly increase until predetermined voltage levels are reached, said voltage control means also being responsive to the cut-off voltage from a power supply source to cause the voltages controlled by said voltage control means to linearly decrease until predetermined voltage levels are reached, said voltage control means also including time delay means for delaying the commencement of decrease of voltage levels when said supply source voltage is cut off; and

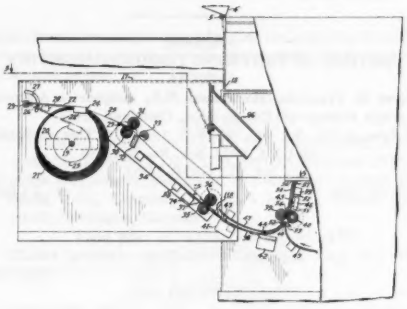
wherein said power supply means is an AC voltage source provided with rectifier means for rectifying the alternating current from said AC voltage source, and wherein said voltage control means further includes time constant circuit means comprising a capacitor and a first resistor connected through said switching means to an output terminal of said rectifier means, a second resistor arranged to be connected to said capacitor when said switching means cuts off said supply means, a second switching means coupled to said supply means for controlling the supply of alternating current from said AC voltage source and a trigger means for generating a pulse for triggering the trigger circuit of said second switching means in accordance with the output of said capacitor, thereby the phase angle of conduction of said second switching means is controlled in accordance with the output of the time constant circuit so that the voltage output of said voltage control means will linearly increase or decrease.

3,922,082

BOND PAPER PHOTOCOPYING MACHINE

Angelo C. Cavallaro, Jacksonville, and Jon F. Crehore, Mandarin, both of Fla., assignors to Cavalier Products, Inc., Jacksonville, Fla.

Filed Oct. 19, 1973, Ser. No. 407,870
Int. Cl.[2] G03G 15/24
U.S. Cl. 355—3 R 7 Claims



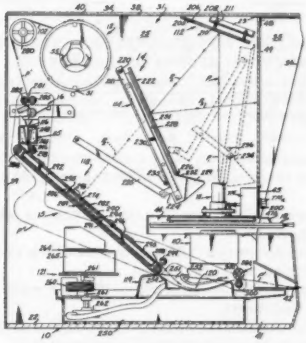
1. In a xerographic bond paper photocopying machine, the combination of a pair of spaced, upwardly extending paper guide members for guiding a sheet of copy paper therebetween and terminating upwardly in paper delivery ends, a horizontal document window disposed above said paper delivery ends, said guide members having flared apart lower end portions, a horizontal paper tray adapted to hold a stack of precut bond copy paper laterally spaced in a predetermined direction from one side of said members, means including a paper guide extending from said tray and comprising an upwardly curved end portion terminating between said flared lower end portions for feeding a sheet of paper from a stack in said tray in a direction opposite to said predetermined direction toward and upwardly between said guide members, a bond copy paper roll holder adapted to hold a roll of paper laterally spaced in a direction opposite to said predetermined direction from the opposite side of said members, means disposed adjacent said holder and between said holder and said paper guide members for drawing paper from such roll and severing from the paper from such roll a sheet of predetermined length from the advancing end of such paper, paper guide means for such severed sheet disposed between said paper drawing and severing means and said guide members and means for advancing such sheet into and along said guide means, said paper guide means extending in said predetermined direction away from said paper drawing and severing means and toward said guide members and including a final upwardly curved guide portion terminating between said flared lower end portions for feeding such severed sheet toward and upwardly between said guide members, a paper sheet delivery roller disposed above said lower end portions and below said paper delivery ends for nippingly engaging a sheet so fed between said members from said paper guide means or from said paper guide, first actuating means for actuating said drawing and severing means and said advancing means, second actuating means for actuating said sheet feeding means, and means for selectively operating one and the other of said first and second actuating means.

3,922,083

ELECTROSTATIC COPYING DEVICE WITH PAPER CUTTER MECHANISM

Lawrence M. Freeman, 599 Ansley Court, NE., Atlanta, Ga. 30324, and Francis T. Arnold, 2379 Tristan Circle, NE., Atlanta, Ga. 30345

Continuation-in-part of Ser. No. 304,519, Nov. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,114, May 24, 1971, Pat. No. 3,730,622. This application June 17, 1974, Ser. No. 479,657
Int. Cl. G03b 21/00
U.S. Cl. 355—13 28 Claims



1. In an apparatus for electrostatically copying images from an original document onto copy paper including a supply of copy paper, an image forming means for reproducing the image on the original document medium onto the copy paper, and conveying means for selectively transporting said copy peper from said supply of copy paper through the image forming means; the improvement comprising:

a single drive motor having a rotary output shaft;

a driving member carried by the rotatable with said output shaft;

a driven member means;

a flexible endless transfer member drivingly connecting said driven member means with said driving member and movable along a prescribed path between said driving member and said driven member means by said driving member;

said conveying means including paper feed means for selectively feeding copy paper along a prescribed path from said supply of copy paper toward said image forming means;

a paper cutting assembly positioned across said prescribed path along which said copy paper is moved by said paper feed means and through which said copy paper passes, said assembly including:

a pair of cutting members positioned in a cutting relationship to each other and between which said copy paper passes, and

positioning means operatively connecting said pair of cutting members for positioning said cutting members in a first cocked position at which said copy paper can freely pass between said pair of cutting members and for moving said cutting members through a second cutting position to cause said cutting members to cut said copy paper; and, control means carried by said flexible endless transfer member for selectively causing said positioning means to position said cutting members in said first cocked position and to move said cutting members through said second cutting position to cut said copy paper to a prescribed length.

3,922,084
CONTROLLED DOCUMENT RECORDING SYSTEM

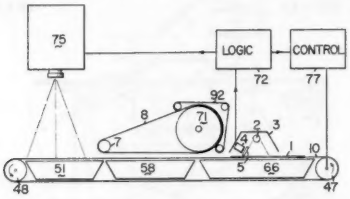
John S. Burton, Los Angeles, and Ronald L. Whitney, San Fernando, both of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

Filed Jan. 2, 1974, Ser. No. 430,140

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G03B 27/52

U.S. Cl. 355—41 **15 Claims**



1. A document photography system comprising;
   a. means to transport (**10**) and photograph (**75**) documents (**1**),
   b. means to illuminate (**2**) said documents while being transported,
   c. control documents (**12**) having selected marks (**6,7,9,11**) at selected positions thereon,
   d. means electrically responsive to illumination (**4**) returned from said marks,
   e. control means (**77**) operatively connected to said means to transport and photograph documents, and
   f. logic means (**72**) connected to said means electrically responsive to illumination, and to said control means,
      to control said means to transport and photograph documents according to commands inherent in said selected marks;
      said control documents being dimensioned such as to be selectively intermixable with documents to be photographed.

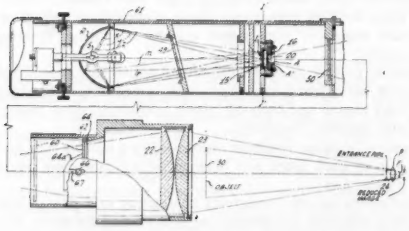
3,922,085
ILLUMINATOR FOR MICROPHOTOGRAPHY

Ronald E. Sheets, Westminster, Calif., assignor to Tamarack Scientific Co. Inc., Orange, Calif.

Filed Aug. 22, 1974, Ser. No. 499,655

Int. Cl.² G03B 27/76

U.S. Cl. 355—71 **7 Claims**



1. In an illuminator for microphotography, the combination of:
   a primary light source in the form of an arc,
   means for collecting light from said source and directing it to a source image in a focal plane,
   optical means including a relay lens for collecting divergent light from said source image and directing it toward a focus,
   means for supporting a photographic transparency forwardly of said relay lens, to be illuminated thereby,
   a projection lens whose entrance pupil receives said directed light and which forms a real, inverted image of said transparency, to a predetermined scale, in front thereof, and
   a neutral density filter spaced between said relay lens and said source image, the transmission characteristic of said filter increasing radially outward from its center toward its periphery in a predetermined manner compensating for progressive radially outward decrease in intensity tending to occur in the divergent light between said source image and said relay lens.

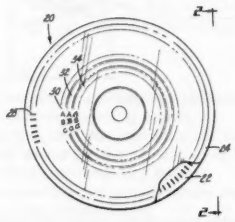
3,922,086
METHOD OF PROVIDING PHOTOCOMPOSITION INDICIA

Alfred H. Freericks, Hopatcong, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Division of Ser. No. 443,706, Feb. 19, 1974. This application Sept. 23, 1974, Ser. No. 508,350

Int. Cl.² G03B 27/62

U.S. Cl. 355—76 **2 Claims**



1. The method of obtaining and projecting a series of characters in light and shadow image for photocomposition, comprising the steps of:
   providing a photocomposition machine having a power driven disc mount hub;
   providing a font disc comprised of a character transparency disc characterized by a physical rigidity insufficient to be self-supporting in a planar condition under static gravitational conditions;
   providing a ridged base member having a planar face surface;
   assembling said disc and base on said hub in a relative nonrotatable relationship with said font disc adjacent said planar face of the base, and
   pumping air out of the space between the disc and base by rotating said assembly at a speed at least equal to that required to produce a centrifugal pumping action which expels said trapped air and results in an atmospheric pressure differential forcing said disc into intimate contact with said base over essentially the entire mutual surfaces therebetween.

3,922,087
MULTIPLE COPYING METHOD AND APPARATUS

Brian St. Pierre Dillow, Skarholmen, Sweden, assignor to Misomex Aktiebolag, Hagersten, Sweden

Filed Oct. 3, 1973, Ser. No. 403,207

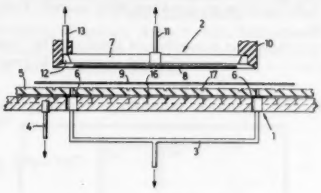
Claims priority, application Sweden, Oct. 6, 1972, 12981/72

Int. Cl.² G03B 27/20

U.S. Cl. 355—87 **8 Claims**

1. Apparatus for multiple copying in which several part exposures are made on a light sensitive base comprising, a support having a rubber blanket mounted thereon; a printing frame mounted above said support and movable vertically with respect to said support; means for attaching a master film

to said printing frame by applying subatmospheric pressure thereto; said rubber blanket being attached to said support at

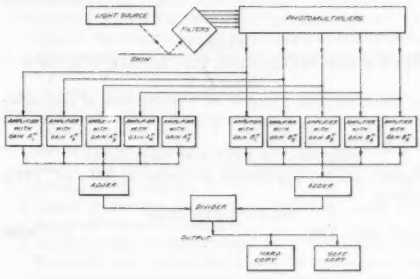


spaced attachment points; and means for attaching the rubber blanket by adhesive suction to the support between said attachment points.

3,922,088
METHOD AND APPARATUS FOR PHOTOMETRIC MEASUREMENT OF CONCENTRATION RATIOS

Dietrich W. Lubbers, Dortmund, and Reinhard Wodick, Dortmund, Loh,, Germany, assignors to Max Planck Gesellschaft, Gottingen, Germany

Filed Apr. 15, 1974, Ser. No. 461,150
Claims priority, application Germany, Aug. 27, 1973, 2343097
Int. Cl.² G01N *33/16*
U.S. Cl. 356—40 **12 Claims**



1. A method of photometrically measuring the concentration ratio of the two components of a two-component system, comprising

a. directing five monochromatic light beams having respective ones of five predetermined wavelengths towards the system while only the first component is present in the system, and measuring the intensity of the five beams at portions thereof directed away from the system, these measured intensities constituting calibrating intensities;

b. directing three monochromatic light beams having respective ones of a predetermined three of the five wavelengths towards the system while only the second component is present in the system, and measuring the intensity of the three beams at portions thereof directed away from the system, these measured intensities constituting additional calibrating intensities;

c. directing five monochromatic light beams having respective ones of the five wavelengths towards the first component with the first component removed from the system and separated from the second component, and measuring the intensity of the five beams at portions thereof directed away from the first component, these measured intensities constituting further calibrating intensities;

d. directing three monochromatic light beams having respective ones of a predetermined three of the five wavelengths towards the second component with the second component removed from the system and separated from the first component, and measuring the intensity of the three beams at portions thereof directed away from the second component, these measured intensities constituting still further calibrating intensities;

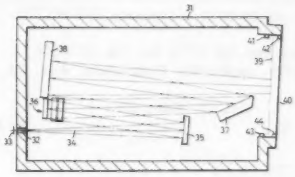
e. directing five monochromatic light beams having respective ones of the five wavelengths towards the system while both the first and the second component are present in the system, and measuring the intensity of the five beams at portions thereof directed away from the system, these measured intensities constituting system intensities; and

f. deriving the relative concentrations of the two components in the system from the values of the calibrating intensities and of the system intensities.

3,922,089
APPARATUS AND METHOD FOR THE UNIFORM SEPARATION OF SPECTRAL ORDERS

Nils Allan Danielsson, Angsvagen 7, Sollentuna, and Karl-Peter Christian Lindblom, Axvagen 77, Jarfalla, both of Sweden

Filed Mar. 14, 1973, Ser. No. 340,980
Claims priority, application Sweden, Mar. 17, 1972, 3451/72
Int. Cl.² G01J *3/18*
U.S. Cl. 356—74 **5 Claims**



1. A spectral apparatus for the separation of spectral orders through multiple wave length dispersion, the apparatus comprising in optical sequence: an entry means for receiving rays of incident light, first dispersing means in the form of an optically coacting prism-grating combination for dispersing the wave lengths contained in said incident light, and second dispersing means, the dispersion of which is at an angle to that of the first dispersing means, in the form of a main grating for dispersing the wave lengths contained in such incident light.

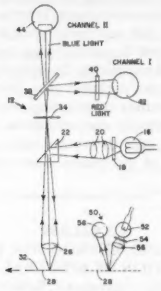
3,922,090
METHOD AND APPARATUS FOR AUTHENTICATING DOCUMENTS

David L. Fain, Berkeley, Calif., assignor to Teknekron, Inc., Berkeley, Calif.

Filed June 28, 1974, Ser. No. 483,990
Int. Cl.² G06K *9/08*; G01J *3/46*
U.S. Cl. 356—71 **11 Claims**

1. Apparatus for authenticating documents by counting the number of fibers or lines or predetermined color and predetermined physical dimension on the document, comprising: a light source producing illumination focusable on a document and reflectable thereoff; means for moving the document with respect to the illumination focused thereon by the light source; means for spectrally discriminating the illumination reflected from the document into signals representing the predetermined color; means for measuring a physical dimension of the fibers or lines on the document from the signals representing the predetermined color; and means responsive

to the discriminating means and the measuring means for counting the number of fibers or lines having the predetermined color and predetermined physical dimension on the document.



3,922,091

AUTOMATIC DRAFT COMPENSATING CIRCUIT FOR DIGITAL SPECTROPHOTOMETER

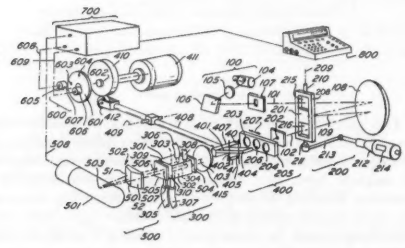
Tito Suva, Geneva, and Manuel C. Sanz, Grand Lancy, both of Switzerland, assignors to Micromedic Systems, Inc., Philadelphia, Pa.

Filed Apr. 30, 1973, Ser. No. 355,827

Claims priority, application Switzerland, Apr. 28, 1972, 6418/72

Int. Cl.² G01J *3/42*

U.S. Cl. 356—93 **13 Claims**



1. Apparatus for correcting for drift in substances being measured in a digital spectrophotometer comprising:

means for adjusting the spectrophotometric digital output to correct for drift in said substances;

said adjusting means including means to multiply said digital output by a variable factor to thereby vary the number of pulses in said spectrophotometric digital output; and

means to vary said factor so that the adjusted digital output of a standard sample that has undergone drift is equal to a preselected standard.

3,922,092

MONOCHROMATOR AND LIGHT DISPERSING APPARATUS

Francois J. G. van den Bosch, 11 Hillcrest Road, Cedar Grove, N.J. 07009

Filed Dec. 6, 1973, Ser. No. 422,421

Int. Cl. G01J *3/12*

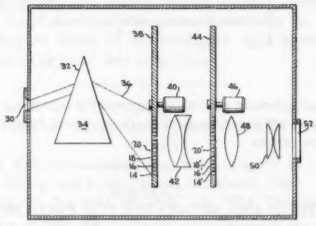
U.S. Cl. 356—100 **16 Claims**

1. Apparatus for generating narrow band light spectra, comprising:

a source for generating wide band light spectra;

first means having a number of apertures and mounted to rotate in a path whereby said apertures intersect said wide band light spectra to produce first narrow band light spectra;

second means having a number of apertures and mounted to rotate in a path whereby said apertures intersect said first narrow band light spectra to produce second narrow band light spectra;



the bandwidth of said second narrow band light spectra are narrower than the bandwidth of said first narrow band light spectra; and

means for rotating said first and second means synchronously.

3,922,093

DEVICE FOR MEASURING THE ROUGHNESS OF A SURFACE

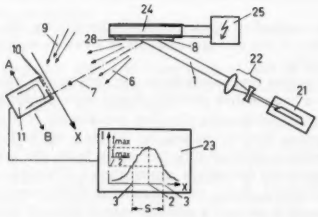
Rene Dandliker, and Francois M. Mottier, both of Oberrohrdorf, Switzerland, assignors to BBC Brown, Boveri & Cie., AG, Baden, Switzerland

Filed Nov. 16, 1973, Ser. No. 416,649

Claims priority, application Switzerland, Nov. 24, 1972, 17073/72

Int. Cl.² G01B *11/30*

U.S. Cl. 356—120 **17 Claims**



1. A method for measuring the roughness of a surface where the surface is illuminated with a light beam and where the spatial distribution of the intensity of the reflected light is photoelectrically measured comprising:

determining the intensity maximum of the reflected light;

determining two points at which the intensity of the reflected light has fallen to a selected fraction of the intensity maximum; and

measuring the distance between the two points along the intersection of the plane of incidence of the illuminating light beam with a plane perpendicular to the direction of the specular reflection, the distance providing a measure of the surface roughness.

3,922,094
APPARATUS FOR MEASURING DIAMETER, OUT-OF-ROUNDNESS AND VIBRATION OF AN OBJECT TO BE MEASURED

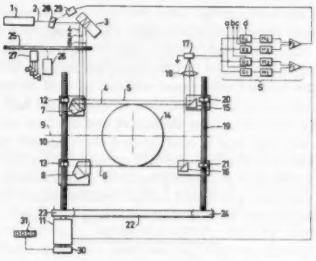
Bertil Colding, Vasteras; Arne Novak, Sollentuna, and Unto Sandstrom, Stockholm, all of Sweden, assignors to Verkstadsteknik AB, Vasteras, Sweden

Filed Feb. 5, 1974, Ser. No. 439,744

Claims priority, application Sweden, Feb. 14, 1973, 7302067

Int. Cl. G01b *11/00*

U.S. Cl. 356—167 **6 Claims**



1. An apparatus for measuring diameter out-of-roundness and position of an object to be measured, comprising

a. means for directing measuring light beams, one on each side of the object, to run at a distance relative one another so that said measuring light beams are subjected to a partial screening by the object;

b. means for directing at least one reference beam unscreened by the object;

c. detector means provided in the beam path after the object for detecting the intensity of said measuring light beams and said at least one reference beam after their passage of the object;

d. signal processing means for processing output signals from said detector means;

e. control means to be actuated by output control signals from said signal processing means for synchronous translatory motion of said measuring light beams with maintained distance relative each other in order to adjust said measuring light beams symmetrically about the object irrespective of its portion in the existing measurement range; and

f. means coupled to said signal processing means for permitting the passage of said measuring light beams and said reference beam in a definite order.

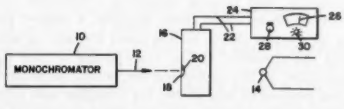
3,922,095
WAVELENGTH CALIBRATOR FOR CLINICAL INSTRUMENTS

Jin G. Lee, 718 34th St., San Francisco, Calif. 94121

Filed June 1, 1973, Ser. No. 366,225

Int. Cl.² G01J *1/42*

U.S. Cl. 356—225 **16 Claims**



1. Apparatus for calibrating a spectrophotometer or like instrument having an adjustable monochromator adapted to transmit a substantially monochromatic light beam, said apparatus comprising:

a narrow-band light filter having a known center wavelength, said filter adapted to be interposed in the light beam;

a photoelectric element adapted to be interposed in the light beam downstream of the light filter so that light passing through said filter impinges on said photoelectric element, said element having an electrical conductance proportional to the radiant intensity of said light impinging on said element;

means for measuring the electrical conductance of the photoelectric element,

whereby the monochromator or like device can be adjusted to obtain maximum transmittance through the light filter to calibrate the monochromator at the center wavelength of the filter.

3,922,096
QUANTIZED INDICATION ARRANGEMENT

Chiharu Mori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

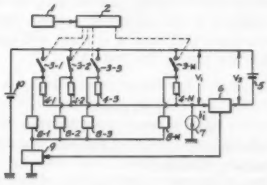
Division of Ser. No. 286,988, Sept. 7, 1972. This application Dec. 26, 1973, Ser. No. 430,944

Claims priority, application Japan, Sept. 11, 1971, 46-70510

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G01J *1/44*

U.S. Cl. 356—226 **9 Claims**



1. A quantized indicating unit comprising:

a photo-sensitive circuit means providing a controllable constant current source and connected in a circuit path for current flow;

a plurality of impedance means;

means for selectively coupling any one of said impedance means in said path for current flow;

means for sequentially scanning through a sequence of states, said coupling means responding to each different one of said states for coupling at least one different impedance means into said current path, thereby causing, for each of said states, a signal on said coupled impedance means corresponding to the amount of said current flow and to the coupled impedance means;

a source of a reference signal;

means for comparing said signal with said reference signal; an indicating element for each of said impedance means; and

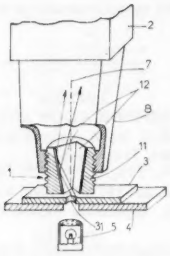
means coupled to said scanning means and comparing means and responsive to a correspondence detected by said comparing means for switching an indicating element into an indicating condition which element corresponds to the impedance means that is coupled into said current path.

3,922,097

OPTICAL APPARATUS FOR THE MICROSCOPIC EXAMINATION OF THE INTERNAL WALLS OF AN OPENING

Philippe Nachet, Neuilly, France, assignor to Societe d'Optique, Precision Electronique et Mecanique - Sopelem, Paris, France

Filed May 28, 1974, Ser. No. 473,999
Claims priority, application France, July 17, 1973, 73.26099
Int. Cl.[2] G01N 21/16
U.S. Cl. 356—241 1 Claim



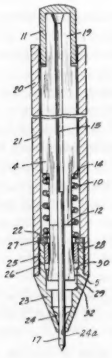
1. Optical device for the microscopic examination of the inner walls of an orifice, comprising a mounting for location between a microscope apparatus and the orifice centered on the optical axis of the apparatus, and plane mirrors providing images of the walls of the orifice arranged in the mounting whose reflecting surfaces are turned towards an axis of the mounting which will be on the optical axis, the mirrors being inclined in relation to the mounting axis, so that the spacing of the mirrors from that axis in relation will decrease in the direction from the lens to the orifice.

3,922,098

MECHANICAL PENCIL

Otto Katz, Schwabach, Germany, assignor to A. W. Faber-Castell, Nuremberg, Germany

Filed Dec. 10, 1973, Ser. No. 423,476
Claims priority, application Germany, Dec. 8, 1972, 2260065
Int. Cl.[2] B43K 21/22
U.S. Cl. 401—94 10 Claims



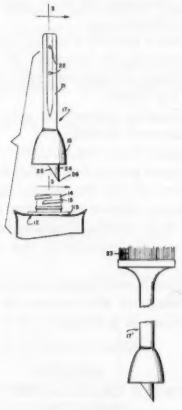
1. A mechanical pencil comprising elongated housing means having an axial bore; lead guide and collect means extending longitudinally through said axial bore and being guided therein for movement in longitudinal direction between a lead clamping and a lead releasing position, said lead guide and collet means consisting of two elongated mirror-symmetrically arranged half shells of thermoplastic material having first inner planar faces abutting against each other and second inner planar faces set back with respect to said first planar faces and separated by a gap, said second planar faces being joined to one end of said first faces by a shoulder, said planar faces having each a central longitudinally extending groove of substantially semi-cylindrical configuration for guiding the lead in longitudinal direction and each of said grooves having at the other end of the half shells a free edge, said half shells having in the region of said second planar faces outwardly flaring portions forming together a substantially conical end portion; annular means in said housing means having an inner surface smaller than the maximum diameter of said conical end portion and arranged for cooperation therewith; biasing means in said housing means for biasing said lead guide and collet means in one direction relative to said housing means so that said inner surface of said annular means engages said conical end portion whereby said half shells will resiliently bend about the shoulders and the free edges of said grooves will bite into a lead guided therein; and means connecting said half shells at the end opp ite from the free edges to each other and projecting beyond said housing means for moving said lead guide and collect means against the force of the biasing means to said lead releasing position.

3,922,099

APPLICATOR DISPENSER

William C. Christine, 341 St. John St., Catasauqua, Pa. 18032, and William E. R. Watt, P.O. Box 20, Barto, Pa. 19504

Filed June 26, 1974, Ser. No. 483,419
Int. Cl.[2] A46B 11/02
U.S. Cl. 401—134 3 Claims



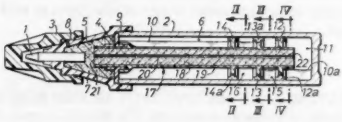
1. In an applicator dispenser, a normally closed pouch of flexible material having a quantity of material therein to be dispensed, a fitment mounted on an end of said pouch and said fitment including a generally circular flange portion secured to said pouch, said fitment including a threaded cylindrical collar having interrupted teeth thereon, a hollow probe including an annular sleeve having inner threads for selectively engaging the threaded collar, there being a fluid tight seal provided between the probe and the pouch, serrations on the inner end portion of said sleeve for engaging said interrupted teeth, said probe including an elongated portion of reduced size, and discharge means on said probe, said probe being provided with a puncturing element that has an inclined cutting edge that terminates in a tip so that when the probe is screwed down onto the collar, the puncturing element will

puncture the portion of the pouch in the vicinity of the fitment so that material can be dispensed from the pouch through the probe onto the desired area.

3,922,100
WRITING IMPLEMENT

Nobutaka Saito, 12-15 Showa-cho, Higashi-Osaka, Osaka, Japan

Filed Sept. 12, 1974, Ser. No. 505,378
Int. Cl.² B43K *5/00*
U.S. Cl. 401—199 **4 Claims**

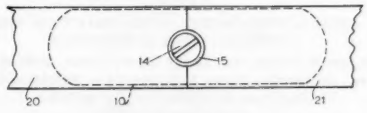


1. A writing implement comprising a barrel including in its interior a front compartment and an ink reservoir separated from the front compartment by a partition, a fibrous material nib projecting from the front compartment, an ink absorbing member including a liquid-absorbent rod-like core and a non-absorbent material surrounding the peripheral surface thereof parallel to the longitudinal axis of the core, at least one compartment provided at the rearmost portion of the barrel and having a smaller capacity than the ink reservoir, and a passage means for connecting the ink reservoir with the rearmost compartment, wherein the ink absorbing member is positioned in the interior of the barrel with the non-absorbent material separating the core from the reservoir, one end of the ink absorbing member being positioned in the front compartment and the other end of the ink absorbing member being position in the rearmost compartment.

3,922,101
CONNECTOR MEANS FOR HOLLOW RECTANGULAR TUBING

Garland R. Salmon, Jr., and Marshall C. Sutherland, Jr., both of Durham, N.C., assignors to Marshall C. Sutherland, Jr., Durham, N.C.

Filed Sept. 9, 1974, Ser. No. 504,720
Int. Cl.² F16B *7/00*
U.S. Cl. 403—292 **1 Claim**



1. In a structure employing hollow rectangular tubing as structural members, in combination:

a. a first hollow rigid tube of rectangular cross section and having an end to be abutted to an end of another tube of similar construction, said end including in one sidewall of said tube adjacent the end edge thereof a centrally positioned, semi-circular notch adapted to loosely receive the shaft portion of a screw member;

b. a second hollow rigid tube of the same said rectangular cross section and having an end to be abutted and joined to said first tube end and having a said notch similarly positioned and sized to mate with the notch of said first tube;

c. a solid rigid rectangular bar member having equal rounded end portions adapted to be loosely inserted within the respective said tube ends, said bar member having a threaded hole located midway of its length and width and extending perpendicularly of the sidewalls thereof;

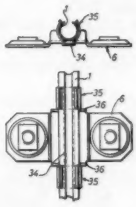
d. a screw member having a threaded shaft and a screw head for turning, said screw member shaft being adapted to being loosely received by said notches and to being threadably mounted in said threaded hole; and

e. a dish-shaped resilient washer fitted on said shaft and being adapted when said tube ends are firmly abutted and said screw head is fully turned to flatten and press against the exterior of the respective notched sidewalls of the said tubes and cause said bar member to press against the interior of said respective notched sidewalls to permanently secure and align such tubes.

3,922,102
DEVICE FOR FASTENING CABLE GUIDE TUBES IN MOTOR VEHICLES

Fritz Marr, Offenbach am Main, and Hans Dauernheim, Sprendlingen, both of Germany, assignors to H.T. Golde GmbH, Frankfurt am Main, Germany

Filed June 29, 1973, Ser. No. 375,070
Claims priority, application Germany, July 3, 1972, 2232597
Int. Cl.² F16D *1/00*; B25G *3/00*
U.S. Cl. 403—346 **6 Claims**



1. Device for fastening an axially elongated slotted guide tube for a pressure rigid cable which can be displaced within said guide tube for operating movable parts in a vehicle, such as a sliding window or sliding roof in an automobile, comprising a fastening plate, said guide tube having a circularly shaped outer surface and being arranged on said fastening plate with its slot facing outwardly from said fastening plate, the circular shaped outer surface of said guide tube being in direct surface contact with the surface of said fastening plate, means for interengaging said guide tube and said fastening plate, a two pair of arms connected to said fastening plate and extending about and in pressing contact with the circularly shaped outer surface of said guide tube on opposite sides of the slot therein and with the ends of said arms contacting said guide tube terminating short of the slots in said guide tube so that said arms secure said guide tube to said fastening plate, and said interengaging means comprising a projection formed from the surface of one of said fastening plate and said guide tube and extending at least into the surface of the other one of said fastening plate and said guide tube to provide interengagement therebetween so that said interenaging means prevent both displacement of said guide tube in its axial direction and rotation of said guide tube about its axis.

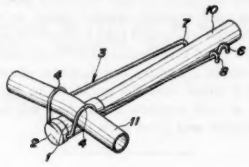
3,922,103
PIPE CLASPER

Motohide Hirato, 2-13-18, Hase, Kamakura, Kanagawa, Japan

Filed Oct. 18, 1974, Ser. No. 515,885
Int. Cl.² F16B *7/00*
U.S. Cl. 403—397 **3 Claims**

1. A pipe clasper comprising a cap body adapted to fit over the end of a first pipe to be clasped with one end closed, a wire receiving aperture towards said closed end, and a band body made of a single resilient linear wire material bent so as to

define a central portion pivotally inserted in said cap body receiving aperture, a pair of bent portions adapted to fit around a second pipe to be clasped, said bent portions extending from both sides of said central portion, and a pair of



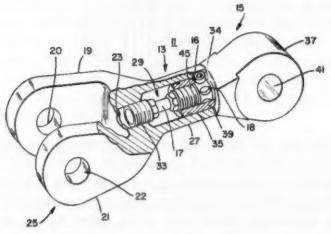
straight portions extending from the bent portions, the end of one of said pair of straight portions being bent to provide a hook portion and the end of the other straight portions being bent to provide a stop portion and an engaging portion.

3,922,104

TENSION LINK CONTROL DEVICE

Thomas W. McCullough, San Francisco, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 20, 1974, Ser. No. 508,010
Int. Cl.² F16B 7/18
U.S. Cl. 403—2 **2 Claims**



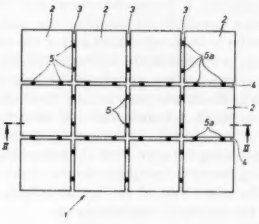
1. A tension link control device comprising:
a. first and second force transmitting means;
b. said first force transmitting means having first and second sections, said first section including at least one force transmitting element, and said second section including a hollow cylindrical member and a threaded member;
c. said second force transmitting member having first and second sections, said first section including at least one force transmitting element, and said second section including a hollow cylindrical means;
d. the inside diameter of the hollow cylindrical member being greater than the outside diameter of said hollow cylindrical means;
e. said hollow cylindrical means including inside threads and being inserted into one end of said hollow cylindrical member;
f. a frangible tension link comprising a cylindrical member having a first threaded end and a second threaded end with a reduced portion therebetween;
g. said first threaded end being in engagement with said threaded member of said first force transmitting means and said second threaded end being in engagement with said inside threads of said second force transmitting means;
h. torsional means for transmitting a torque between said first and second force transmitting means independent of said first and second threaded ends; whereby
i. said threads of said first and second threaded ends are selected to have a pitch that permits a considerable amount of axial play with respect to the threads of said threaded member and said inside threads respectively for transmitting tension loads between said first and second force transmitting means;
j. a plurality of slots arranged radially in the cylindrical member of said first force transmitting means;
k. a plurality of tapped holes corresponding to said slots and arranged radially in said hollow cylindrical means of said second force transmitting means;
l. attaching means for maintaining each of said slots and tapped holes in a fixed relationship; whereby
m. torsional forces applied to said first force transmitting means are transferred to said second force transmitting means without transfer of any of said force to said tension link.

3,922,105

PAVING SLAB HAVING SPOT GLUED BLOCKS

Hans Bolli, Weinberglistrasse 46, CH-6005 Lucerne, Switzerland

Filed Feb. 15, 1974, Ser. No. 443,094
Int. Cl.² E01C 5/00
U.S. Cl. 404—34 **8 Claims**



1. A paving slab comprising a plurality of individual blocks spaced apart from each other in a predetermined pattern, adjacent blocks of said slab having opposed side edges, said opposed side edges having opposed recesses therein, said recesses extending at right angles to the plane of said slab and extending from the tops of said blocks to locations above the bottoms of said blocks, said blocks being spot connected to each other by a flexible adhesive, said adhesive extending between the bottoms of opposed recesses.

3,922,106

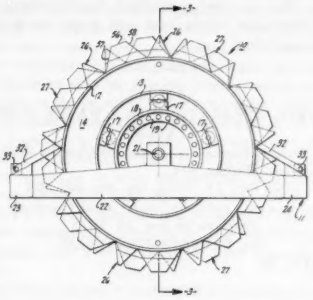
COMPACTION WHEEL WITH TRACTION AND CRUSHING CHARACTERISTICS

Fred Joseph Caron, and James Oliver Caron, both of Reno, Nev., assignors to Caron Compactor Co., Stockton, Calif.

Filed Apr. 22, 1974, Ser. No. 462,862
Int. Cl.² E01C 19/26
U.S. Cl. 404—121 **14 Claims**

1. A fill and compaction roller comprising a rigid cylinder forming a rim, means for mounting the cylinder upon a vehicle, and ground engaging feet of first and second types mounted on said cylinder, said first type of feet serving to supply traction characteristics to said roller and comprising relatively permanent bases fixedly secured to the surface of the cylinder and replaceable wear-caps welded to said bases, said bases and wear-caps forming units which are substantially Vee-shaped presenting cutting tractive edges extending laterally of the rolling direction, the feet of the first type being arranged in at least two circumferential rows, one located along each side portion of said cylinder, the feet in the respective rows being in a non-aligned staggered relationship, said second type of compaction feet serving to afford destructive, crushing characteristics to said roller, and comprising a relatively permanent base fixedly secured to the surface of the cylinder and a replaceable wear-cap welded to said base, said

bases and wear-caps forming units which are generally trapezoidal in side elevation, having fore and aft cutting edges inclined from the surface of said cylinder and merging into outer cutting edges, said cutting edges extending in the rolling direction, said units on the sides tapering laterally outwardly from the outer cutting edges to the surface of said cylinder, the feet of said second type being arranged in a circumferen-



tial row disposed intermediate the rows of feet of the first type and staggered in the same circumferential direction, the spaces between adjacent rows of feet on said roller forming circumferential slots about the rim of said roller, and the spaces between the feet in adjacent rows forming diagonally transverse slots on the surface of the cylinder facilitating dirt ejection.

3,922,107

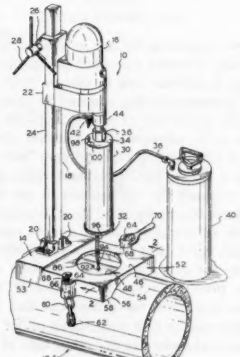
SEWER TAPPING METHOD AND APPARATUS

Dwight W. Fowler, 705 SW. 206th Ave., Aloha, Oreg. 97005

Filed May 31, 1973, Ser. No. 365,693

Int. Cl.² B23B *41/00*; B23Q *3/18*

U.S. Cl. 408—67 **13 Claims**



1. A core drill having a drill bit, means for rotating said drill bit, a supporting base, and a standard for supporting said means for rotating said drill bit from said base,

said base being positionable for receiving and engaging the side of a sewer main for directing the drill bit toward a core area in the side wall of said sewer main to be removed to provide an aperture for attachment of a branch connection to said sewer main,

a connecting member for removably securing said core area to said drill bit for preventing loss of a drilled core within said sewer main,

and swivel means connected to said connecting member, said connecting member and said swivel means being operatively connected between said core area and said drill bit.

3,922,108

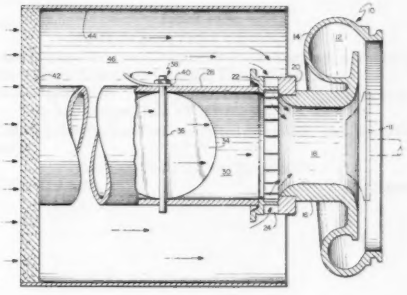
PRE-WHIRL TURBO CHARGER APPARATUS

Edward F. Benisek, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,369

Int. Cl.² F01D *5/14*

U.S. Cl. 415—116 **2 Claims**



1. A compressor installation for a turbocharger for imparting prewhirl to air entering the compressor, including,

a. a rotary centrifugal compressor having an impeller and having an elongated input flow duct defining a central intake passage in fluid communication with the intake of the impeller,

b. said flow duct having a rotary pivoted disc valve positioned therewithin to control the amount of air passing through the said duct towards said impeller,

c. a plurality of peripherally disposed passages in said duct which establish fluid communication between the interior and the exterior of the said duct, said passages including means for imparting a tangential velocity to air passing therethrough into the duct interior from the duct exterior,

d. said peripheral openings being axially located in said duct between said rotary pivoted disc valve and said centrifugal impeller,

e. a casing surrounding said duct, one end of said casing being closed and meeting said duct at a region downstream of said peripherally disposed passages to thereby define an enlarged annular plenum chamber closed at one end, the other end of said plenum chamber being open and unrestricted and communicating with ambient air.

3,922,109

ROTOR FOR FLOW MACHINES

Hermann Hagen, Dachau, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Germany

Filed Aug. 29, 1973, Ser. No. 392,818

Claims priority, application Germany, Aug. 29, 1972, 2242448

Int. Cl.² F01D *5/30*

U.S. Cl. 416—213 **13 Claims**

1. A rotor wheel for flow machines comprising:

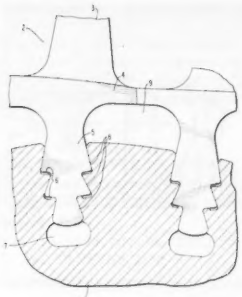
a rotor disk made of relatively deformable material and including a plurality of radially extending blade accepting dovetail slots,

and a plurality of rotor blades fixedly seated in respective ones of said slots by weld means, said blades being made of a highly heat-resistant material different from the material of the rotor disk, each of said blades including an airfoil portion, a root portion and a collar-type widening portion between said root and airfoil portions,

wherein the widening portions of adjacent blades abut one another to form a closed hoop around the circumference of and spaced from the rotor disk, said hoop and the outer circumference of the rotor disk forming an annulus which is intersected by parts of respective root portions of the blades,

wherein said weld means is brazing material,

wherein each of said blade root portions have a plurality of lateral faces which face away from the radius extending from the center of the disk through the center portion of the associated blade, said lateral faces being arranged in pairs with each lateral face of a pair arranged at the same radial distance from the center of the disk, each blade



including at least two of said pairs of lateral faces spaced radially from one another, the lateral faces of a pair being inclined toward one another and being engageable with respective sidewalls of respective dovetail slot portions of the respective slot accommodating the respective blade, wherein the lateral faces of each pair are arranged at opposite sides of and inclined at a similar angle with respect to a disk radius through the respective blade, and wherein the angles of inclination for the lateral faces of one pair are different than for those of an adjacent radially spaced pair of lateral faces for the same respective blade, whereby the temperature gradient through the root portion of said blade can be accommodated by the respective different angular inclinations.

3,922,110

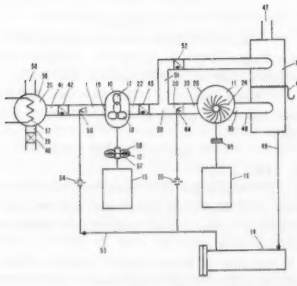
MULTI-STAGE VACUUM PUMP

Henry Huse, Darien, Conn.

Filed Jan. 28, 1974, Ser. No. 437,374

Int. Cl. F04b *41/06;* **F04c** *19/00;* **F04b** *23/00*

U.S. Cl. 417—2 **12 Claims**



1. A multi-stage vacuum pumping system, including in combination a first stage positive displacement pump, a second stage liquid ring pump, means providing direct fluid communication between the outlet of the first stage pump and the inlet of the second stage pump, first and second constant speed driving means for said first and second stage pumps respectively, constant torque coupling means coupling said first driving means to said first stage pump, direct non-slipping coupling means coupling said second driving means to said second stage liquid ring pump, said constant torque coupling means having means to provide slip whereby the speed of said first stage pump is reduced when the established torque loading of said first coupling is attained thereby maintaining a pressure differential across said first stage pump below a predetermined value.

3,922,111

CONTROL APPARATUS FOR A WATER SUPPLY SYSTEM

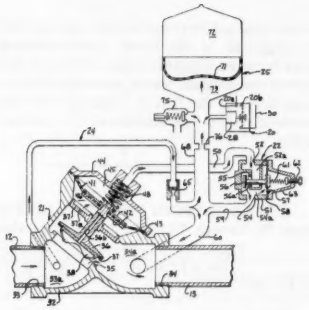
Elmer M. Deters, Muscatine, Iowa, assignor to Weil-McLain Company, Inc., Dallas, Tex.

Filed Oct. 11, 1973, Ser. No. 405,305

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] F04B *49/00, 49/08*

U.S. Cl. 417—26 **7 Claims**



1. A control apparatus for use in a water supply system of the type having a motor operated pump operable to pump water through a delivery line to one or more valved outlets, said control apparatus being adapted to control starting and stopping of the pump motor and to regulate pressure in the delivery line to a substantially constant delivery pressure during normal flow through the delivery line and comprising:

a. a main valve casing having a main valve inlet and a main valve outlet adapted for connection in the water system to have water from the pump flow therethrough to the delivery line, said main valve casing having a main valve seat intermediate said main valve inlet and said main valve outlet, a main valve member for controlling flow through said main valve seat, a main pressure responsive movable wall operatively connected to said main valve member and having one side exposed to pressure at said main valve outlet, means defining a main pressure chamber at the other side of said main pressure responsive movable wall for applying pressure thereto in opposition to the pressure at said one side of the main pressure responsive movable wall, control passage means communicating said main valve inlet with said main pressure chamber for passing a restricted flow of water to the main pressure chamber to pressurize the main pressure responsive movable wall in a direction to close the main valve member,

b. a pressure operated motor control switch responsive to the pressure at said main valve outlet for energizing the pump motor when the pressure at the main valve outlet reaches a preset lower switch operating pressure and for deenergizing the pump motor when the pressure at the main valve outlet reaches a preset upper switch operating

pressure to thereby control starting and stopping of the pump,

c. a pressure regulating pilot valve including a pilot valve casing having a pilot valve inlet communicating with said main pressure chamber and pilot valve outlet communicating with said main valve outlet and a pilot valve seat intermediate said pilot inlet and pilot outlet, a pilot valve member for controlling flow through said pilot valve seat, pilot valve biasing means for applying a preselected substantially constant force to said pilot valve member urging the same toward an open position, a pilot pressure responsive movable wall responsive to the pressure at said main valve outlet and operatively connected to said pilot valve member for moving the pilot valve member against the force of said pilot valve biasing means to a closed position as the pressure at the main valve outlet increases to a preselected delivery pressure intermediate said upper and lower switch operating pressures, said pilot valve controlling flow from said main pressure chamber and being operative to vary the pressure therein and effect movement of the main valve member toward and away from its seat to maintain the pressure at the main valve outlet substantially constant at said preselected delivery pressure over a wide range of flow through the main valve,

d. a pneumatic pressure tank communicating with said main valve outlet; and

e. a bypass communicating said main valve inlet with said main valve outlet and said pneumatic pressure tank for passing a restricted flow thereto when the main valve is closed to refill the pneumatic pressure tank until the pressure increases at the main valve outlet to said upper switch operating pressure and said motor control switch deenergizes the pump motor.

3,922,112

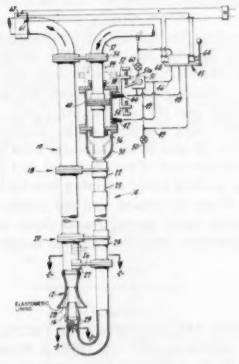
EDUCTOR JET PUMP AND METHOD

John A. Miscovich, Orange, Calif., assignor to Marcona Corporation, San Francisco, Calif.

Division of Ser. No. 398,981, Sept. 20, 1973, Pat. No. 3,816,027, which is a continuation of Ser. No. 181,017, Sept. 16, 1971, abandoned. This application Mar. 25, 1974, Ser. No. 454,127

Int. Cl.² F04F *5/48*

U.S. Cl. 417—54 **4 Claims**



1. A method for removing supernatant liquid or other material from a vessel or pool provided with apparatus including an eductor jet submerged in said liquid and having a nozzle in a discharge relationship with a Venturi throat section of a discharge conduit, comprising the steps of pumping a high velocity liquid through the nozzle as a jet directed into said throat to educt therewith a charge of said liquid through said discharge conduit, moving said nozzle toward and away from said throat section over a given cycle time to vary the rate and amount of eduction force applied to each charge of liquid, and sensing the character of the discharge of the liquid in the discharge line, and closing the nozzle unit into sealing engagement with the throat section whenever the character of the discharge indicates that the solids content thereof exceeds the predetermined level or that flow rate falls below a predetermined value.

3,922,113

METERED SUPPLY OF LIQUIDS

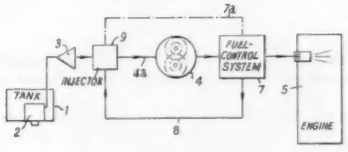
Horace George Turner, Chandler's Ford, England, assignor to The Plessey Company Limited, Essex, England

Continuation of Ser. No. 318,783, Dec. 27, 1972, abandoned. This application July 11, 1974, Ser. No. 487,765

Claims priority, application United Kingdom, Jan. 6, 1972, 570/72

Int. Cl.² F04B *23/04*; F04F *5/48*

U.S. Cl. 417—79 **10 Claims**

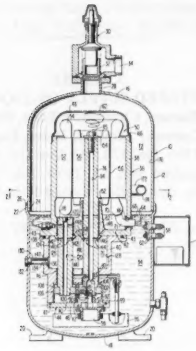


1. A system for the metered supply, to a load, of liquid under pressure, which comprises: a source of liquid; a delivery line for the supply of such liquid to the load; a positive-displacement pump having a pump inlet and a pump outlet; delivery-control means having an inlet connected to said pump outlet, a main outlet connected to said delivery line, and a spill outlet arranged to receive substantially all the liquid delivered by said pump except for the liquid which is received by said main outlet, said delivery-control means being operative to variably control the flow to the load through said delivery line by varying the portion of the liquid from said pump outlet received by said spill outlet; and an injector device having a housing formed with an interaction chamber and with a combined-flow outlet extending from said chamber, a main-flow inlet connected to said source, and a power-flow inlet connected to said spill outlet to receive all the liquid passing through said spill outlet, both said inlets leading into said interaction chamber, and said pump inlet being so connected to said combined-flow outlet as to receive all the flow from said outlet and no other flow, said injector device further including a geometry-varying element having a passage in which one of said inlets terminates said passage in said geometry varying element coaxially facing said combined-flow outlet, said geometry-varying element being axially displaceable relative to said combined-flow outlet; and actuating means which automatically displace, in accordance with operation of the delivery-control means to provide a different rate of spill flow, said geometry-varying element in the direction in which the resulting geometry variation improves the pressure-raising effect of the injector device at said different rate of spill flow.

3,922,114
HERMETIC ROTARY HELICAL SCREW COMPRESSOR WITH IMPROVED OIL MANAGEMENT

Clark B. Hamilton, Wethersfield; Harold W. Moody, Jr., and Donald D. Schaefer, both of Farmington, all of Conn., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed July 19, 1974, Ser. No. 490,169
Int. Cl.² F04B *39/02*
U.S. Cl. 417—366 **11 Claims**



1. A hermetic rotary helical screw compressor comprising: a closed, vertically oriented generally cylindrical outer enclosure,

an inner cylindrical housing concentrically fixed within said outer enclosure and forming with said outer enclosure a first sealed chamber therebetween,

said inner housing including an upper compressor discharge housing fluid sealed from and overlying a lower compressor inlet housing, said upper compressor discharge housing forming a second chamber, and

said lower compressor inlet housing forming a third chamber sealed from said first and second chambers,

a compressor inlet tube extending inwardly through said outer enclosure wall and through said lower compressor inlet housing and opening up into said third chamber,

intermeshed helical screw rotors rotatably supported within said lower compressor housing and in fluid communication with said inlet tube for compressing a working fluid supplied to said inlet tube,

a compressor discharge passage fluid connecting the upper end of said first chamber to the lower end of said second chamber,

an electric drive motor coaxially supported within said upper compressor discharge housing above said compressor discharge passage, and including a fixed stator and a concentric rotor rotatably positioned within the same,

a quantity of oil provided within said outer enclosure with the bottom of said outer enclosure forming an oil sump, an oil pump within said outer enclosure in fluid communication with said sump,

means for delivering oil under pressure from said pump to said screw compressor screw rotors for lubrication and mixing with said compressor working fluid passing therethrough,

a first axial fluid passage means within said motor for passing compressed working fluid and entrained oil axially upward to cool the motor and for impingement against the upper end of compressor discharge housing,

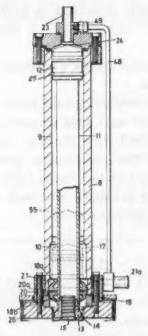
second axial fluid passage means within said motor for passing said compressor discharge and entrained oil axially downward to further cool said motor,

and radial passage means fluid connected to the second axial passage means for directing the compressed working fluid and the entrained oil radially outwards of said upper compressor discharge housing and into said first chamber for gravity separation of said oil from said compressed working fluid and return to said sump.

3,922,115
PUMP

George Harold Coe, Sutton, and Ronald Percy Bowden, Great Brookham, both of England, assignors to Metering Pumps Limited, London, England

Filed Aug. 21, 1973, Ser. No. 390,258
Claims priority, application United Kingdom, Aug. 23, 1972, 39324/72; Mar. 2, 1973, 10287/73
Int. Cl.² F04B *9/14*; F01B *31/00*
U.S. Cl. 417—374 **6 Claims**



1. A metering piston pump including a vertical cylinder having a smaller diameter bore portion and a greater diameter bore portion at the lower end of said smaller diameter bore portion, a piston rod extending coaxially through the cylinder, a piston disposed at the upper end of said piston rod and dimensioned to conform closely with said smaller diameter portion of the bore for sealing-tight pumping operation therewithin, means for driving said piston upwardly and downwardly along said narrow diameter bore portion, means for optionally withdrawing the piston down into said larger diameter bore portion and for guiding the piston coaxially of the larger diameter bore portion, drain means communicating with the bottom of said wider diameter bore portion, and seal means in the lower end of said cylinder and surrounding said piston rod for guiding liquid draining into said larger diameter bore portion from the piston and the smaller diameter bore portion to drain away through said drain means when the piston is withdrawn entirely into the larger diameter bore portion.

3,922,116
REVERSING MECHANISM FOR DOUBLE-ACTION HYDRAULIC OIL WELL PUMP

Toby Sydney Pugh, Arlington, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 15, 1974, Ser. No. 460,858
Int. Cl.³ F04B *17/00*; F15B *13/09*
U.S. Cl. 417—393 **5 Claims**

1. Valving mechanism for use in a double-acting hydraulic oil well pump having a central sliding piston rod with upper

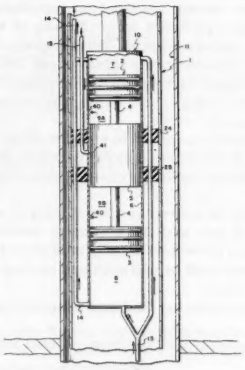
and lower pistons thereon located in a pump barrel, said valving mechanism comprising:

inner mandrel means snugly encircling the piston rod of the pump in slidable relationship therewith;

port means passing through said inner mandrel means;

passing means between said inner mandrel means and the piston rod and adapted for communication with said port means;

housing means concentrically mounted about said inner manadrel means and adapted to allow sliding movement of said inner mandrel means therein; said housing means



further adapted to be interconnected between and in axial alignment with two sections of pump barrel;

flow passage means through said housing means arranged to be placed in communication with said inner mandrel port means;

seal means between said housing means and the oil well tubing inner diameter; and,

hydraulic damping means between said inner mandrel means and said housing means arranged to provide fluidic resistance to rapid movement of said inner mandrel means with respect to said housing means.

3,922,117

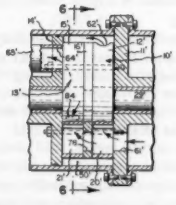
TWO-STAGE ROOTS TYPE COMPRESSOR

Roger C. Weatherston, Williamsville, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Division of Ser. No. 305,411, Nov. 10, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,521

Int. Cl.[2] F01C *11/00;* **F04C** *23/00, 17/10;* **F01C** *1/18*

U.S. Cl. 418—9 **3 Claims**



1. In a multi-stage Roots type compressor, comprising a first stage housing defining a first interior working chamber, a second stage housing adjacent said first stage housing defining a second interior working chamber, a pair of rotary coacting multilobed impellers arranged in each of said first and second working chambers and severally with said first and second stage housings providing closed well volumes, a first inlet and outlet communicating with said first working chamber, a second inlet and outlet communicating with said second working chamber, means providing communication between said first outlet and said second stage closed well volumes, and means providing communication between said first and second inlet.

3,922,118

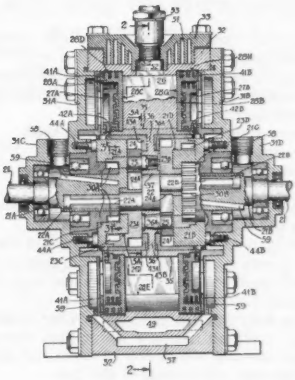
ROTARY VANE PISTON DEVICES WITH STATIONARY SPUR GEARS AND CRANKSHAFT HUB BEARINGS

Charles Bancroft, P.O. Box 14, Wakefield, N.H. 03888

Filed Nov. 28, 1973, Ser. No. 419,879

Int. Cl.[2] F01C *1/00;* **F04C** *17/00;* **F02B** *55/14*

U.S. Cl. 418—37 **9 Claims**



1. An improved alternately accelerating rotary piston device of the type having a stator housing forming an annular chamber, a plurality of sets of angularly spaced vane pistons successively arrayed in the chamber, a rotatable support member for each piston set, each set of pistons having at least two vanes secured to one of said rotatable support members, a crankshaft rotatably mounted on a crankshaft axis in the stator housing and having two crankpins oppositely offset, and two connecting members each rotatably mounted on one of said crankpins, and each interconnecting all of the piston support members in torque-transmitting relationship to said one of the crankpins of the crankshaft, wherein the improvement comprises:

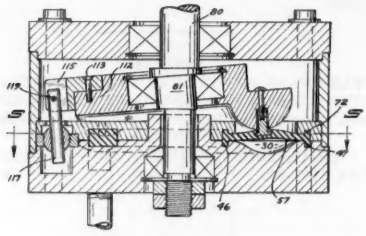
A. spur gear means fixedly secured to the stator housing having outwardly facing teeth concentric about the crankshaft axis, and

B. ring gear means integral with each connecting member and having inwardly facing teeth concentric with its supporting crankpin and engaging the spur gear teeth, whereby the vane piston sets, the crankshaft and the connecting members all rotate in the same angular direction.

3,922,119
PERISTALITIC DIAPHRAGM PUMP STRUCTURE

Roger K. Rosenquist, Chaska, Minn., assignor to AmRose Corporation, Chaska, Minn.

Continuation of Ser. No. 190,752, Oct. 20, 1971, abandoned.
This application June 14, 1973, Ser. No. 369,808
Int. Cl.² F01C 5/00; F03C 3/00; F04C 5/00, 17/00
U.S. Cl. 418—45 9 Claims

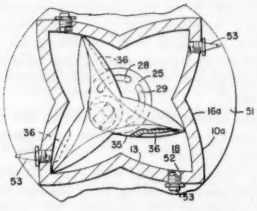


1. A peristaltic diaphragm pump structure having in combination
- a base member comprising a pump chamber having an inlet and an outlet port,
- a diaphragm extending across said pump chamber,
- a piston comprising a wabble head in operative engagement with said diaphragm,
- a non-linear shaft operating said wabble head,
- means driving said shaft,
- means extending through said wabble head removably securing said diaphragm to said wabble head,
- a passage extending vertically through a rim portion of said wabble head,
- a rod having its upper end portion disposed in said passage, means pivotly securing said rod in said passage for swinging movement of said rod toward and away from said shaft of said wabble head,
- a spherical ball carried in said base member underlying said passage, said ball having a diametrical passage therethrough and said rod having its lower end portion disposed through said passage of said ball,
- whereby said rod accommodates the tilting action of said wabble head and inhibits said wabble head against circumferential movement relative to said diaphragm.

3,922,120
ROTARY ENGINES

Charles M. McCullough, 900-17 Henderson, Sunnyvale, Calif. 94086, and Jerome K. Maples, 2050 Fordham Drive, Santa Clara, Calif. 95051

Filed July 30, 1973, Ser. No. 384,071
Int. Cl.² F04C 17/16
U.S. Cl. 418—5 20 Claims

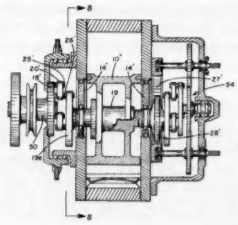


1. A rotary engine comprising:
- a housing having axially spaced end walls and a peripheral wall interconnecting the end walls to form a four-lobed cavity having an axis and being of constant cross section along said axis, said cavity having four corner edges spaced equidistantly from and equiangularly around said axis, said cavity having two wall surfaces facing and spaced from each corner edge, the wall surfaces being sections of a circular cylinder whose axis is along the corner towards which said wall surfaces face and whose radius is equal to the distance between adjacent corner edges,
- a three-lobed rotor disposed in said cavity and having an axis parallel to and offset from the axis of said cavity and being of constant cross-section along the axis thereof, said rotor having three apexes equidistant from each other and equidistant from the axis of said rotor, the distance between apexes being equal to the distance between adjacent cavity corner edges, the rotor having a shape between each pair of apexes generally complementary to the shape of said cavity between adjacent corner edges thereof,
- a shaft rotatably journaled in and extending through one of said end walls into said cavity coaxially therewith,
- means forming a radially extending slot on one end of said shaft,
- a drive stub on said rotor coaxial thereof, said drive stub projecting into said slot and being confined therein for translatory movement radially towards and away from the axis of said shaft as said shaft and housing rotate relative to each other,
- means for introducing fluid into selected lobes of said cavity,
- means for exhausting fluid from selected lobes of said cavity.

3,922,121
ROTARY COMBUSTION ENGINE

Marvin Garfinkle, 1136 Morefield Road, Philadelphia, Pa. 19115

Filed Mar. 6, 1974, Ser. No. 448,728
Int. Cl.² F04C 1/02
U.S. Cl. 418—61 A 2 Claims



1. A rotary combustion engine comprising:
- a piston housing:
  - rotary piston means with a substantially triangular profile; eccentric support means rotatably mounted within the walls defining the piston housing for supporting said piston means for rotary and orbital motion within said housing at a speed ratio between said support and said piston means of substantially 3:1;
  - rotable power output means, said piston means having an axis of rotation arranged eccentrically relative to the axis of rotation of said rotatable power output means; coupling means connecting said piston means to said power output means and being effective to establish a 1:1 speed ratio between said power output means and said piston means in response to rotary and orbital movement of said piston means.

3,922,122

APPARATUS FOR MOLDING AN EMBOSSED PATTERN ON THE PERIPHERAL BAND OF A TOROIDAL ARTICLE, IN PARTICULAR ON TIRE TREADS

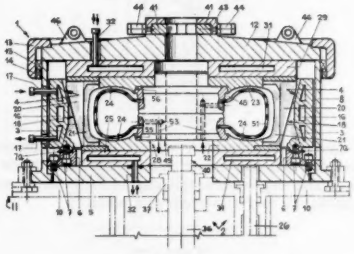
Franco Bottasso, and Antonio Pacciarini, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 315,991, Dec. 18, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 531,076

Claims priority, application Italy, Dec. 17, 1971, 32526/71; Oct. 20, 1972, 30711/72

Int. Cl.² B29H *5/08*

U.S. Cl. 425—46 **8 Claims**



1. In an apparatus for molding an embossed pattern on the peripheral band of a toroidal article, in particular on the tread of a tire, said apparatus comprising

a mold having upper and lower sidewall sections arranged to press the sidewalls of the article, and an intermediate section comprising a plurality of segments arranged to press the peripheral band of the article itself, when the mold is closed,

driving means for radially moving said segments in consequence of their axial displacements,

a press for opening and closing the mold,

means for admitting and discharging a curing fluid at a suitable temperature and pressure with respect to said article to obtain curing of said article, the improvement which comprises

said driving means having means for originating a compression stress between the connected faces of at least two contiguous segments when the mold is assembled before molding and curing and having means for originating a reduction of said stress during molding and curing while always maintaining said connected faces of said contiguous segments in direct mutual contact whereby molding and curing can be effected outside of said press and

locking means for mutually engaging said upper and lower sidewall sections with said driving means when the mold is assembled.

3,922,123

CORE REMOVAL APPARATUS

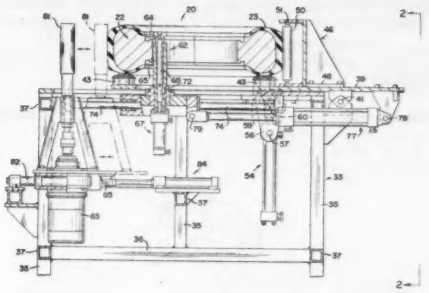
Charles D. Spragg, Brunswick, and Walter Tomaszewski, Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 29, 1975, Ser. No. 544,989

Int. Cl.² B29H *5/08*

U.S. Cl. 425—48 **11 Claims**

4. Apparatus for removing a multi-section core from a vehicle tire including means for mounting a tire, a core clamp located at said mounting means and adapted to move between first and second positions, means for moving said core clamp between said first and second positions, said core clamp having jaw means adapted to move between open and closed positions to grasp a section of a multi-section core, said core clamp when moved from said first to said second position with said jaw means thereof closed and grasping a core section of



a multi-section core removing the core section from the vehicle tire.

3,922,124

SLIDING MOULD FOR CONCRETE PILES INCLUDING SLIPFORM AND ROLLERS

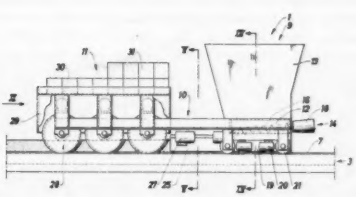
Georg Bjorhaag, Karl bergsvagen 21, 662 00 Amal, Sweden

Filed Aug. 8, 1972, Ser. No. 278,711

Claims priority, application Sweden, Aug. 12, 1971, 10272/71

Int. Cl.² B28B *13/02*

U.S. Cl. 425—64 **2 Claims**

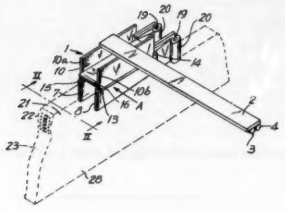


1. Machine for casting concrete piles comprising a molding bed having a plurality of elongated open top lower mold halves, step shaped tracks on said molding bed extending longitudinally of and alongside the open tops of said lower mold halves, a concrete feeding bin having bottom outlets, means in said bin capable of feeding concrete under pressure through said bin openings, wheels supporting said bin and riding on said tracks with said bin openings each positioned above one of said open tops of said lower mold halves, sliding mold halves each having an interior cross-section corresponding to, but larger than the interior cross-section of one of said lower mold halves, a frame, a plurality of rollers rotatably connected to said frame on an axis perpendicular to the longitudinal axis of said lower mold halves, each of said rollers having stepped shaped side peripheries each corresponding to and rolling on one of said tracks and a middle portion having a lateral peripheral configuration corresponding to and of the same size as the cross-sectional contour of the interior of its corresponding lower mold halve, vibrators connected to said rollers, weights connected to said rollers, and bars connecting said bin, said sliding mold halves and said frame in that order and with said sliding mold halves each positioned above the open top of one of said lower mold halves and series of said plurality of rollers with each said series having its rollers positioned one behind the other along the lengths of and on said tracks alongside one of said lower mold halves whereby the concrete beneath said series of rollers can be given a decreasing sectional area by said roller middle portions.

3,922,125
APPARATUS FOR FORMING CONTINUOUS LENGTHS OF CONSTRUCTION ELEMENTS

Borge Christensen, Sortemosen, 2690 Karlslunde, Denmark

Continuation of Ser. No. 100,672, Dec. 22, 1970, abandoned.
This application Apr. 4, 1973, Ser. No. 347,914
Claims priority, application Denmark, Dec. 23, 1969, 6859/69
Int. Cl.² B29D 27/04
U.S. Cl. 425—64 7 Claims



1. In an apparatus for continuously manufacturing shell-formed elongate, continuous construction elements, buildings or the like, of curable high-viscosity building materials, said apparatus being longitudinally movable relative to said elements and comprising; a jib; a mold being mounted on said jib; piping on said jib for continuously feeding said curable high-viscosity building material to said mold; said mold including a supporting element rigidly fixed relative to said jib; endless movable belts defining wall portions of said mold being supported on said supporting element; a generally vertical plate extending transversely of the relative motion between said elements and said mold being located on a front end of said supporting element; and cavity forming means for said elements in said plate, the improvement comprising: said supporting element being substantially H-shaped in crosssection, said endless belts having portions extending around the lower vertical projecting parts of the H-shape and around its horizontal bar, said plate having a hole for introducing the building material into said mold from said piping on said jib, said cavity forming means including a plurality of parallel short wires of small cross-section, said wires being fastened to said plate so as to project into said mold in a direction coextensive with the longitudinal path of relative movement between said elements and said apparatus, said wires being positioned in closely spaced relationship in the center portion of the mold and at increasingly larger material distances toward the edges of said mold; and means connected to said supporting element for continuously feeding reinforcing and insulating bands into the space between said belts and the material being fed into said mold whereby the bands are continuously laminated to the surfaces of the building material.

3,922,126
APPARATUS FOR COLLECTING WASTE POLYMER

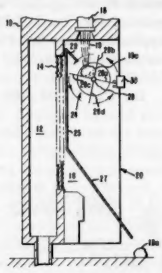
Charles Richmond Seaver, and Stephen Everett Sewell, II, both of Hixson, Tenn., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 12, 1974, Ser. No. 523,128
Int. Cl.² D01D 7/00
U.S. Cl. 425—72 3 Claims

1. An apparatus for collecting polymer issuing from a spinneret into a quenching chimney comprising:

a paddle wheel having a plurality of paddles for collecting polymer mounted for rotation in said chimney below said spinneret, said paddles extending across said chimney and having outer edges traveling in a circular path as said paddle wheel rotates from one collecting position to the next;

means for indexing the paddle wheel from one polymer collecting position to the next in response to a desired weight of polymer collected on a paddle; and

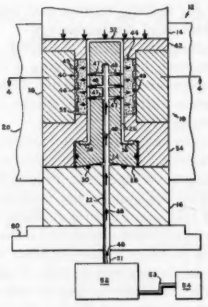


a cutting blade mounted in said chimney adjacent said circular path above said paddle wheel, said blade having a cutting edge oriented parallel to the outer edges of the paddles as they move past said blade.

3,922,127
APPARATUS FOR MAKING A METAL PRINT DRUM

Peter Schwarzkopf, Westminster, Calif., assignor to Peter Schwartzkopf, Westminster, Calif.

Filed May 9, 1973, Ser. No. 358,560
Int. Cl.² B30B 5/02, 11/00
U.S. Cl. 425—78 4 Claims



1. Apparatus for making a hollow cylindrical metallic print drum having raised type characters on its outer surface, comprising:

a compressible cylindrical character sleeve having character depressions formed on the inner surface thereof;

rigid die means surrounding said character sleeve; and

isostatic compaction means for pressing powdered metal against the inner surface of said character sleeve in a radial direction with respect to the sleeve axis and for compressing said powdered metal and said compressible character sleeve against said rigid die means, the side walls of said depressions expanding as said sleeve is compressed so as to exert compacting forces in a direction other than said radial direction upon the powdered metal contained within such depressions.

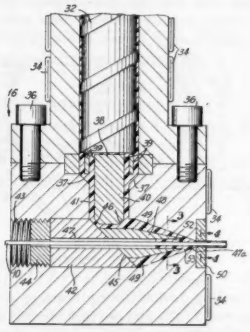
3,922,128
APPARATUS FOR EXTRUDING A CONTINUOUS COATING ABOUT A STRAND

Nathan L. Solomon, Englewood, N.J., assignor to Solo Products Corporation, Englewood, N.J.

Continuation of Ser. No. 747,855, July 26, 1968, abandoned. This application Nov. 11, 1971, Ser. No. 197,994

Int. Cl.² B29F 3/10

U.S. Cl. 425—113 **10 Claims**



1. Apparatus for extruding a coating of plastic material about a moving strand, comprising a die head assembly which receives the plastic material, said head having a first cavity which receives and discharges said plastic material, a generally longitudinally extending core member coaxially extending into the first cavity for substantially its entire length and spaced generally uniformly about its periphery from the surrounding walls of the cavity, for defining the passageway for the flow of plastic material between the walls of the first cavity and the outer peripheral surface of the core, said passageway having a relatively thin depth so as to maintain a thin cross-section of material flow, a wall disposed at an angle to the axis of said first cavity and interrupting the flow of material from the first cavity and diverting the flow into the direction of strand movement, a finger extending from said wall with its longitudinal axis substantially aligned with the axis of said strand and having a generally conical portion, said finger being received within a mating cavity defined by tapered walls, the surface of said finger abutting the walls of said cavity and said tapered walls surrounding a strand discharge opening, a plurality of spaced separate passageways defined by said finger and said tapered walls and communicating with said first cavity and the strand discharge opening, and a die mounted on said head and positioned coaxially to said discharge opening.

3,922,129
CORRUGATING SYSTEM EMPLOYING CONTROLLABLE STEAM SHOWER

William V. McDonald, 3150 Hutchinson, Fort Worth, Tex. 76106

Filed May 10, 1974, Ser. No. 468,807

Int. Cl.² B29C 3/06

U.S. Cl. 425—135 **7 Claims**

1. A corrugating system comprising:

support means for supporting a roll of paper,

corrugating rollers for corrugating a sheet of paper as it is drawn from the roll,

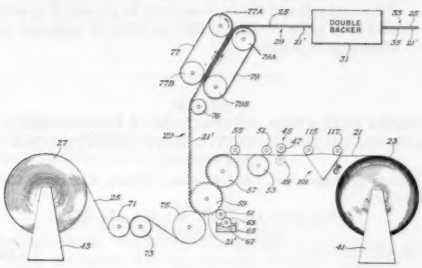
a steam shower located between said support means and said corrugating rollers and comprising a plurality of separate steam injection means located across the width of the sheet of paper for injecting steam onto the sheet of paper as it is drawn from the roll to the corrugating rollers,

a source of steam,

means for supplying steam to said steam shower,

a plurality of moisture detecting means corresponding in number to the number of said separate steam injection means,

said plurality of moisture detecting means being located upstream of said steam shower and across the width of the sheet of paper to detect for moisture in the sheet of paper



across its width as the sheet of paper is drawn from said roll,

each moisture detecting means being located to correspond in position, across the width of the paper, to the position of one of said separate steam injection means, and

control means coupled between each moisture detecting means and its corresponding steam injection means for separately controlling each of said steam injection means if the moisture detected exceeds a predetermined level.

3,922,130
APPARATUS FOR PRODUCING BARKY CHOCOLATE

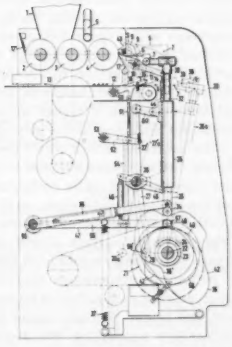
Josef Ernst Marie Bensdorp, Bussum, Netherlands, assignor to Bensdorp International B.V., Bussum, Netherlands

Continuation-in-part of Ser. No. 243,947, April 14, 1972, Pat. No. 3,850,561. This application Apr. 17, 1974, Ser. No. 461,706

Claims priority, application Netherlands, Apr. 16, 1971, 7105135

Int. Cl.² A23G 3/02

U.S. Cl. 425—223 **11 Claims**



1. Apparatus for producing chocolate barkies and the like comprising

a roll rotatable about a horizontal axis of rotation, said roll having a circumferential surface thereof for supporting

and moving therewith a film of chocolate paste or the like,

a scraper having a free edge thereof engageable with said surface of said roll for scraping film from said roll,

a generally horizontal collecting plate having a free edge thereof adjacent said free edge of said scraper, and having an upper surface, said collecting plate receiving on the upper surface thereof film scraped from said roll,

a discharge conveyor disposed below said roll, and

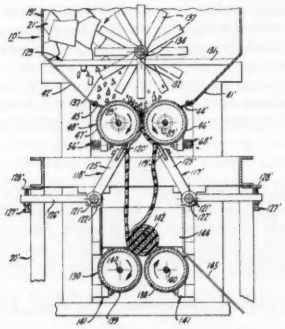
means for moving said collecting plate upwardly and away from said roll and then downwardly to a position in which said free edge of said collecting plate is adjacent said discharge conveyor.

3,922,131

APPARATUS FOR COMPACTING A LOW DENSITY FOAM MATERIAL INTO A HIGH DENSITY FOAM MATERIAL

William J. Stegmeier, 1021 C Shary Circle, Concord, Calif. 94521

Filed June 18, 1973, Ser. No. 371,253
Int. Cl.² B29D *27/04*
U.S. Cl. 425—223 **1 Claim**



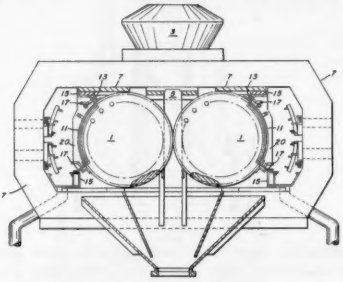
1. Apparatus for reducing a low density, thermoplastic foam material to a higher density mass thereof, comprising: frame structure; a receiver supported by said frame structure and having an inlet through which quantities of such low density material are admitted and an outlet through which material leaves; and compaction mechanism in communication with said outlet for receiving material therefrom and operative to concentrate such material into a higher density mass, said compaction mechanism including heater structure for heating such material to the softening temperature thereof, a pair of rollers having facing surface areas adapted to pass such heat softened material therebetween while compressing the same, drive mechanism for rotating said rollers, each of said rollers being equipped with a heating element effective to elevate the temperature of the cylindrical surface of said roller to provide said heater structure which heats a relatively thin layer of such material to the softening temperature thereof, the heating element with which each of said rollers is equipped extending substantially from end to end thereof, means associated with each of said rollers for supporting the associated heating element for thermal expansion and contractions in generally longitudinally directions, and electric connector means associated with each of said rollers for establishing electrical connection with the heating element thereof and effective to accommodate such longitudinal expansions and contractions thereof.

3,922,132

FLEXIBLE SEAL FOR BRIQUETTE MACHINE

William L. Lauterbach, Upper St. Clair Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 6, 1974, Ser. No. 467,527
Int. Cl.² B29C *15/00*
U.S. Cl. 425—237 **8 Claims**



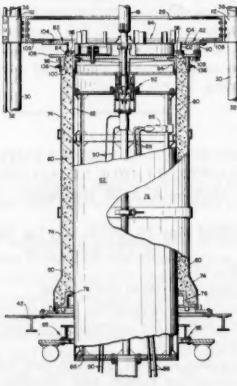
1. A gas sealing device for the housing of a briquette machine having mold rolls and at least one housing opening, for separating gas in the housing from the external atmosphere, comprising a sealing element mounted substantially parallel with the face of the mold roll, a lip entry element thereon and at an angle thereto, a hinge on said sealing element and anchored at a point removed from said lip entry element, whereby a protrusion moving with the face of the mold roll will cause a displacement of said sealing element about said hinge by striking said lip entry element, and a spring element for returning the sealing element to its original position after displacement thereof.

3,922,133

PIPE FORMING PACKERHEAD APPARATUS WITH SPIGOT END PRESSING MEANS

Gerald R. Crawford, and Joseph F. Wenther, both of Sioux City, Iowa, assignors to Concrete Pipe Machinery Company, Sioux City, Iowa

Filed Mar. 28, 1973, Ser. No. 345,743
Int. Cl.² B28B *21/26*
U.S. Cl. 425—262 **20 Claims**



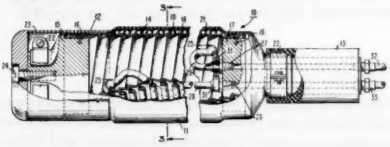
1. A packerhead/vibration system for making pipe of cementitious material in one continuous operation comprising: pipe form means; means for introducing cementitious material

into said pipe form means; a rotating packerhead, upwardly moveable through said pipe form means for making the pipe; means for vibrating the cementitious material comprising the pipe as the pipe is made; means for enabling overfilling said pipe form means with an overfill of the cementitious material and being located on said pipe form means as the pipe is made; means for compressing said overfill into said pipe form means to complete the end of a green pipe; and means on said pipe form means for positioning said overfill compressing means in a first predetermined location as the pipe is made and in a second predetermined location beneath said first predetermined location after said overfill is compressed into said pipe form means to complete the end of a green pipe.

3,922,134
PIPE BENDING MANDREL

Wilbur J. Kupfrian, Binghamton, N.Y., assignor to Robintech Incorporated, Fort Worth, Tex.

Filed Dec. 17, 1973, Ser. No. 425,318
Int. Cl.² B29C *17/06, 17/07;* **B29D** *23/03*
U.S. Cl. 425—292 **12 Claims**



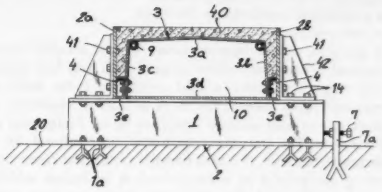
1. A mandrel insertable within a tube for supporting the interior walls of said tube and for inhibiting change in maintaining the cross-sectional contour of said walls while said tube is bent into a curved shape, said mandrel comprising a flexible central core member having a cross-sectional pattern corresponding in shape to but being smaller than the passageway through said tube, said core member being crush resistant, and an expandable peripheral zone enclosing said flexible core said zone being formed of a series of closely adjoining but axially-spaced encircling interconnected passages fully enclosing walls responsive to fluid pressure within said passages for expanding said elastomeric walls into resilient contact with adjoining areas of said core member while applying pressure to said interior walls throughout the portion of said tube to be bent, said zone being responsive upon dissipation of said pressure to recede from said interior walls, whereby sufficient peripheral clearance is developed to permit retraction of said mandrel from said tube following the bending operation.

3,922,135
MOLD FOR CONCRETE C-PROFILES INCLUDING A REMOVEABLE CORE

Hans Haller, and Erwin Wendl, both of Nibelungengasse 40, Graz, Austria

Continuation-in-part of Ser. No. 75,851, Sept. 28, 1970, Pat. No. 3,767,153. This application July 20, 1973, Ser. No. 381,037. The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.
Int. Cl.² B28B *1/08*
U.S. Cl. 425—432 **10 Claims**

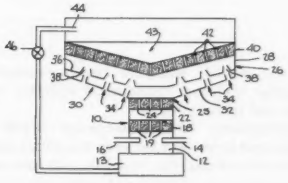
1. A mold for casting a C-profile of concrete, comprising: an outer form including a base and a pair of substantially parallel lateral walls rising fixedly from said base; an inner form lower than said walls removably seated on said base between said walls, said inner form having sides separated from said walls by clearances accommodating a pair of lateral flanges of a C-profile to be molded, said sides being provided with substantially horizontal external ledges spanning said clearances and contacting said walls; at least one pair of longitudinally spaced end members extending across said clearances longitudinally, subdividing same between said forms and resting on said ledges while rising above said inner form to the level of said walls; and anchor means on said inner form enabling the same to be lifted out of said outer form together with said end members and with a molded C-profile having lateral flanges supported by said ledges.



3,922,136
CATALYTIC GAS CONVERTER

Christian Koch, Nurnberg-Grossgrundlach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1973, Ser. No. 421,684
Claims priority, application Germany, Dec. 11, 1972, 2260586
Int. Cl.² F23D *13/12*
U.S. Cl. 431—115 **7 Claims**



1. An apparatus for the complete combustion of a liquid fuel which comprises:

a. means for converting said liquid fuel to a reformed gas containing carbon monoxide, carbon dioxide, and at least one of the group consisting of methane and hydrogen;

b. means for producing a mixture of said reformed gas and oxygen bearing gas; and

c. a radiation plate having a plurality of essentially parallel openings therethrough, one side of said openings being coupled to said means for producing a mixture so as to conduct said mixture from said means for producing through said parallel openings to the other side of said radiation plate said radiation plate adapted to react with said mixture as it passes through openings to produce substantially complete combustion of said liquid fuel.

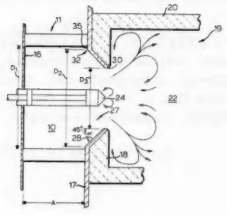
3,922,137
APPARATUS FOR ADMIXING FUEL AND COMBUSTION AIR

Charles F. Peczeli, and Edward T. Tyrcz, both of Mississauga, Canada, assignors to Gulf Oil Canada Limited, Toronto, Canada

Continuation-in-part of Ser. No. 444,719, Feb. 22, 1974, Pat. No. 3,852,020, which is a continuation-in-part of Ser. No. 264,635, June 20, 1972, abandoned. This application Nov. 4, 1974, Ser. No. 520,491
Int. Cl.² F23C *7/00;* **F23L** *1/00;* **F23D** *11/00*
U.S. Cl. 431—183 **4 Claims**

1. An apparatus for admixing combustion air and fluid or finely divided solid fuel in substantially stoichiometric proportions for combustion, comprising:

1. a windbox for maintaining a supply of combustion air under pressure, said windbox having an outer wall and a parallel inner wall contiguous to
2. a cylindrical combustion chamber,
3. a fuel injector,
4. a plurality of overlapping vanes spaced around a hypothetical cylindrical surface coaxial with said fuel injector and extending between said outer and inner walls and perpendicular thereto to form a vortex chamber, the diameter of said surface in inches being designated as a dimension D_1 and the length thereof, defined by the distance between the said parallel outer and inner walls, being designated as a dimension A in inches which is substantially 0.64 D_1, the total minimum inlet area I between said vanes in square inches being substantially

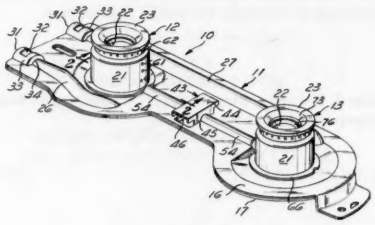


$(0.43\ D_1^2 - 7.63)$, said fuel injector extending through said outer wall and hypothetical cylinder with its discharge end terminating in
5. a substantially 45° frusto-conical nozzle extending through said inner wall between the vortex chamber and the combustion chamber coaxially with said fuel injector, the largest circular diameter of said nozzle being adjacent the vortex chamber and having a diameter D_2 in inches which is substantially 0.95 D_1, the smallest circular diameter of the nozzle having a dimension D_3 of substantially $(0.34\ D_1^2 - 6)^{1/2}$ inches, and
6. the forward end wall of a combustor, adjacent said nozzle and normal to the axis thereof, with a contiguous cylindrical side wall forming said cylindrical combustion chamber coaxial with said nozzle.

3,922,138
GAS RANGE TOP BURNER
William P. Biddle, and John J. Tacker, both of Athens, Tenn., assignors to Athens Stove Works, Inc., Athens, Tenn.
Filed Aug. 19, 1974, Ser. No. 498,303
Int. Cl.² F24C *3/10*
U.S. Cl. 431—193 **5 Claims**

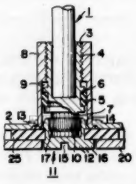
1. A metal burner assembly comprising a base plate element, a burner head including inner and outer shell elements, and an end cap element, said elements being formed of uniform, thin-walled metal stock, at least one of said elements having a circular peripheral edge, another of said elements having an annular surface portion, said peripheral edge being in gastight metal-to-metal contact with said annular surface, a portion of said base plate element cooperating with said inner and outer shell elements to define a plenum chamber therewith, said base plate element including a first aperture associated with said outer shell element and a second aperture associated with said inner shell element, said base plate element having a porcelain coating, the peripheral edges of said first and second apertures being in metal-to-metal gastight sealing engagement with said outer shell element and said inner shell element respectively, the sheet metal wall of said base plate element forming said peripheral edges obliquely engaging the associated surface portions of said outer and inner shell elements.

2. A burner assembly as set forth in claim **1**, wherein said base plate element comprises a pair of metal sheets assembled in overlying relation, an upper one of said sheets providing



said first aperture and a lower one of said sheets providing said second aperture, one of said sheets having an annular embossment concentric about its associated aperture, said inner and outer shell elements being arranged to maintain said embossment in a stressed condition, whereby said embossment is effective by reaction forces to maintain said peripheral edges in gastight sealing engagement with their associated inner and outer shell elements.

3,922,139
GAS-FUELLED LIGHTER
Takaaki Sugawa, No. 57-14, Wakamiya 3-chome, Ichikawa, Chiba, Japan
Filed Apr. 22, 1974, Ser. No. 462,598
Claims priority, application Japan, Feb. 5, 1974 49-14112
Int. Cl.² F23Q *2/16*
U.S. Cl. 431—344 **8 Claims**



1. In a gas-fuelled lighter having a fuel valve actuating member, an outer fuel-adjuster adapted to effect a two-stage fuel adjustment, said outer adjuster being removably supported in the body of the lighter in a first position by means of a resilient member and further including means for permitting said outer fuel-adjuster to be axially removed from and axially reset in the body of the lighter in a different position without changing the position of the fuel actuating member and said outer fuel-adjuster to thereby provide a range of flame lengths that is different from the range of flame lengths at the first position.

3,922,140

KILN FOR TILE

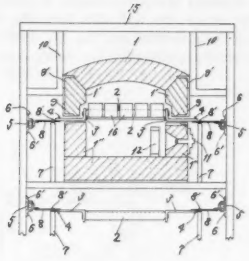
Muneo Noritake, Chita, and Masaharu Takeuchi, Tokoname, both of Japan, assignors to Ina Seito Co., Ltd., Tokoname, Japan

Filed July 9, 1974, Ser. No. 486,833
Int. Cl.² F27B 9/14
U.S. Cl. 432—122 **6 Claims**

1. In a baking apparatus for baking tiles and the like which transports the items to be baked through a kiln on a continuously moving belt which has L-shaped supporting receptacles attached thereto for supporting the items to be baked in an upright position as they pass through the kiln, the improvement comprising:

automatic conveyor belt and chute loading means operatively positioned on both sides of the continuously moving belt at the entrance of the kiln said means including detecting means on each side of the continuously moving belt for detecting the presence of the L-shaped receptacles on the continuously moving belt and conveying means for intermittently sliding the items to be baked in the kiln into the L-shaped supporting receptacles on the continuously moving belt after their presence has been detected by the detecting means and before the belt enters into the kiln; and

automatic unloading means at the exit from the kiln for axially swinging and knocking the items baked in the kiln from the L-shaped receptacle, catching the baked items



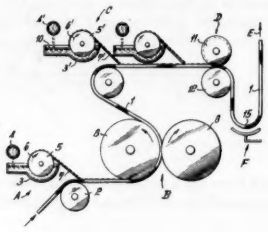
as they fall from the L-shaped receptacles, and conveying the items away from the kiln and the continuously moving belt.

3,922,141

MEANS AND METHOD FOR CONTINUOUS DYEING OF PILE WARP TEXTILES, ESPECIALLY OF CARPETS

Valentin Appenzeller, Kempen (Lower Rhine), and Johannes Kutz, St. Tonis, Krefeld, both of Germany, assignors to Eduard Kusters Maschinenfabrik, Krefeld, Germany

Division of Ser. No. 650,450, June 30, 1967, Pat. No. 3,541,815. This application Dec. 30, 1969, Ser. No. 1,910
Claims priority, application Germany, Apr. 27, 1967, 62144
Int. Cl.² D06P *5/00, 7/00*
U.S. Cl. 8—17 10 Claims



1. A tufted or pile textile continuous dyeing method including causing a length of said textile to travel continuously while applying a liquid wetting agent and thereafter a dyeing liquid to its pile; wherein the improvement comprises pressure squeezing said textile after applying liquid wetting agent and prior to applying dyeing liquid and under pressure squeezing conditions squeezing off and distributing said agent uniformly in said textile throughout the latter and increasing said textile's absorbing power uniformly.

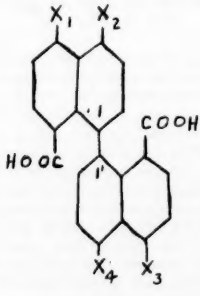
3,922,142

METHOD OF PRINTING TEXTILES WITH DERIVATIVES OF 1,1′-DINAPHTHYL-4,4′,5,5′,8,8′-HEXACARBOXYLIC ACID

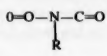
Nikolai Stepanovich Dokunikhin, Sadovaya-Spasskaya ulitsa, 21, kv. 268, and Georgy Nikolaevich Vorozhtsov, Sadovaya-spaskaya ulitsa, 21,, kv. 268, both of Moscow, U.S.S.R.

Division of Ser. No. 246,521, April 24, 1972. This application Dec. 17, 1973, Ser. No. 425,546
Int. Cl.² C07D *221/18;* D06P *1/22*
U.S. Cl. 8—39 10 Claims

1. A method of textile printing, comprising applying onto a textile material a printing paste containing a dinaphthyl compound of the formula:



where X_1, X_2 and X_3, X_4 represent the group



wherein R is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, phenyl, substituted phenyl and pyridyl; or one X of the pair X_1, X_2 and one X of the pair X_3, X_4 represent the group —C=O, the other X then being in the benzimidazole or perinone cycle, the compound of said formula being either symmetrical or non-symmetrical with respect to the 1,1′-bond, a reducing agent and an alkaline agent, and subjecting said textile material with said paste applied thereon to heat treatment and oxidation, whereby in the printed places, directly on the textile material, a perylenetetracarboxylic acid compound is formed.

3,922,143

POLYCARBODIIMIDE TREATMENTS

John M. Schuster, Cottage Grove, and Maynard H. Olson, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 25, 1973, Ser. No. 382,343
Int. Cl.² C14C *3/06, 9/02*
U.S. Cl. 8—94.21 8 Claims

1. Process for improving the dynamic water resistance of porous anionically charged collagen fiber matrix comprising treating said matrix, while water wetted, consecutively or concurrently with:

A. an aqueous float liquor containing a water soluble chromium complex of substituted or unsubstituted alkanoic acid

and

B. an aqueous float liquor containing carbodiimide having a content of —N=C=N— groups of about 10% or more by weight in the weight of the molecule excluding terminal or pendent fluoroaliphatic radicals.

3,922,144

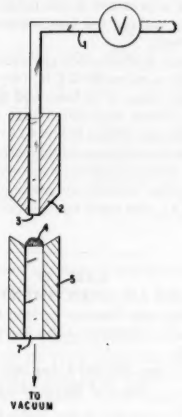
PROCESS FOR APPLYING LIQUID FRESHENING AGENTS TO TEXTILE THREADS

Wolfgang Zöllner, Dusseldorf, Germany, assignor to Henkel & Cie GmbH, Dusseldorf, Germany

Filed Mar. 4, 1974, Ser. No. 447,636
Claims priority, application Germany, Mar. 5, 1973, 2310899
Int. Cl.² D06B *1/04*
U.S. Cl. 8—151.2 6 Claims

1. A process for applying a liquid finishing agent to textile threads or yarn comprising directing a regulatable, free-falling jet of liquid finishing agent of a first diameter and having a first axis onto a moving textile yarn of another diameter and having another axis, said first diameter of said jet corresponding approximately to said another diameter of said yarn; passing said yarn over a suction zone maintained at a vacuum pressure of from about 10 to 400 Torr, said suction zone having an

outlet arranged coaxially with said jet of liquid finishing agent, and said first axis of said jet being approximately perpendicular to said another axis of said yarn; and recovering said textile yarn finished with said liquid agent.



3,922,145

HYPOTHYROID SERUM CONTROL

James E. Turner, Madison, and Michael B. Kenoff, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 28, 1974, Ser. No. 473,463
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **11 Claims**

1. A method for obtaining a hypothyroid serum control comprising the following steps:

A. adding neutral, decolorizing carbon to blood serum in an amount of about 5–20 percent based upon weight of carbon to volume of serum;

B. mixing the above mixture for about 24 hours at a temperature of about 4°C;

C. twice centrifuging the resulting slurry at 34,800 xg and at a temperature of about 4°C;

D. filtering the resultant supernatant;

E. lyophilizing the supernatant so obtained.

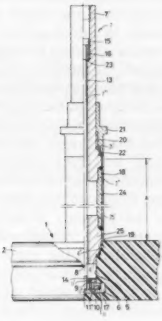
3,922,146

STIRRER AND COVER FOR STIRRING CORROSIVE CHARGES

Dieter Kupka, Binger Landstrasse 37a, 657 Kira, Nahe, Germany

Filed Feb. 16, 1973, Ser. No. 333,002
Claims priority, application Germany, Feb. 16, 1972, 2207207
Int. Cl.² B01F *7/16*
U.S. Cl. 23—252 A **20 Claims**

1. In a stirrer for stirring corrosive charges in corrosion resistant, high pressure reaction tanks, such as glass-lined tanks, the stirrer including a metallic stirring shaft and a plastic stirring element attached to one end of the stirring shaft, said stirring element being driven by said stirring shaft, the stirring element being fabricated as a one-piece element having a plurality of arms, the improvement comprising: a plastic cover covering a portion of the stirring shaft which contacts the corrosive charge, said cover having two end portions with one end portion being sealingly secured to the stirring element and the other end portion being sealingly secured to the stirring shaft wherein said cover has an intermediate portion between its secured end portions which is movable relative to said end portions, and wherein said cover is fabricated so that at least part of its length between its secured ends is resilient and thereby capable of returning to its initial shape as a result of temperature changes.

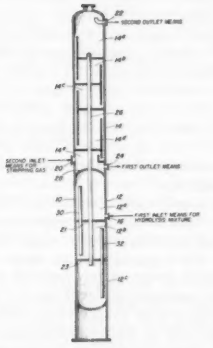


3,922,147

HYDROLYSIS REACTOR

Morgan C. Sze, Upper Montclair, and Benjamin J. Luberoff, Summit, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Apr. 5, 1974, Ser. No. 458,199
Int. Cl.² B01D *47/12;* **B01J** *10/00;* **C07C** *63/26*
U.S. Cl. 23—283 **3 Claims**



1. Apparatus for the two-stage hydrolysis of nitriles and stripping of ammonia from the hydrolysis mixture under pressure comprising:

a vertical reactor;

a substantially horizontal imperforate partition dividing the reactor into an upper chamber and a lower chamber;

first inlet means for introducing a mixture of water and nitrile into an upper portion of the lower chamber;

second inlet means for introducing a stripping gas into a lower portion of the upper chamber;

first outlet means for removing hydrolyzed and stripped product from the lower portion of the upper chamber;

second outlet means for removing stripping gas and ammonia from the upper portion of the upper chamber;

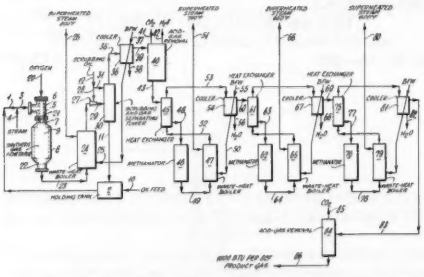
the lower chamber being divided into a plurality of sub-chambers each sub-chamber being connected with the next lower sub-chamber by flow conduit means for transporting hydrolysis mixture from one sub-chamber to the next lower sub-chamber; the upper chamber being divided into a plurality of sub-chambers each sub-chamber provided with means allowing for counter-current contacting of the hydrolysis mixture with a stripping vapor; and a draft tube extending from the lowermost sub-chamber of the lower chamber to the uppermost sub-chamber of the upper chamber, said draft tube being the only connection between the lower chamber and the upper chamber, and said draft tube being the sole outlet for hydrolysis mixture from the lower chamber whereby said hydrolysis mixture from said first inlet means flows downwardly through the plurality of sub-chambers in said lower chamber, upwardly through said draft tube to the uppermost sub-chamber in the upper chamber and then downwardly through the plurality of sub-chambers in said upper chamber to said first outlet means, said downward flow of the hydrolysis mixture in the upper chamber being countercurrent to stripping gas entering said second inlet means.

3,922,148

PRODUCTION OF METHANE-RICH GAS

Edward T. Child, Tarrytown, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Filed May 16, 1974, Ser. No. 470,701
Int. Cl.[2] C10J *3/06*
U.S. Cl. 48—197 R **10 Claims**



1. A process for producing a methane-rich gas stream comprising the steps of

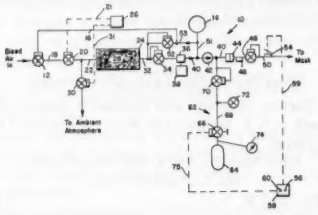
1. reacting a hydrocarbonaceous fuel feed by partial oxidation with substantially pure oxygen and steam at an autogenous temperature in the range of about 1200° to 2200°F., and a pressure in the range of about 25 to 250 atmospheres gauge in the reaction zone of a free-flow unpacked noncatalytic synthesis gas generator, wherein the atomic ratio of oxygen in the free-oxygen containing gas to carbon in the hydrocarbonaceous fuel is in the range of about 0.6 to 1.2, the weight ratio of steam to hydrocarbonaceous fuel is in the range of about 3 to 5, and the stream of effluent gas leaving said synthesis gas generator principally comprises H_2 and CO having a mole ratio (dry basis) H_2/CO of 2.6 and above, CH_4 in the range of 10 to 30 mole % (dry, CO_2-free basis), H_2O, CO_2, particulate carbon, and acid gas containing of a gas from the group CO_2, H_2S, COS, and mixtures thereof;
2. cooling, and purifying the effluent gas stream from (1) in a gas cooling and purification zone thereby removing from the process gas stream substantially all of said particulate carbon, H_2O, and acid gas;
3. preheating the process gas stream from (2) having a mole ratio (dry basis) H_2/CO of 2.6 and above to a temperature in the range of about 400° to 500°F., feeding the preheated gas stream into a first catalytic methanation zone and reacting the H_2 and CO in said process gas stream therein at a temperature in the range of about 1420° to 1570°F. and a pressure in the range of about 25 to 250 atmospheres without the concomitant formation of particulate carbon;
4. withdrawing a methane-rich gas stream from (3) containing about 40 to 60 mole % CH_4 (dry basis) and having a gross heating value of at least **600** BTU/SCF; and
5. cooling by three sequential heat exchange steps said methane-rich gas stream from (4) to below the dew point temperature to condense out and separate water comprising cooling first by indirect heat exchange with water to produce steam, second by preheating the process gas stream in (3), and third by indirect heat exchange with water.

3,922,149

OXYGEN AIR ENRICHMENT METHOD

Joseph M. Ruder, and Thomas L. Iles, both of Palos Verdes Peninsula, Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jan. 30, 1974, Ser. No. 438,062
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—21 **4 Claims**



1. An air enrichment method comprising the steps of:

supplying pressurized inlet air to a container having a sorbent bed;

storing inlet air enriched with one of its constituent gases flowing from the container;

inversely controlling the step of supplying pressurized inlet air in accordance with pressure variations of the stored enriched inlet air; and

cyclically purging the sorbent bed by a timer means that periodically exposes the sorbent bed to a low pressure zone.

3,922,150

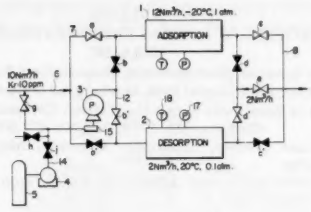
PROCESS AND APPARATUS FOR SEPARATING AND RECOVERING KRYPTON-85 FROM EXHAUST GAS OF NUCLEAR REACTOR OR THE LIKE

Hideo Yusa, Hitachi; Kunio Kamiya, Hitachi; Toshifumi Murata, Hitachi; Hideo Yamaki, Hitachi, and Shigenobu Hisatomi, Kudamatsu, all of Japan, assignors to Hitachi, Ltd. and Power Reactor and Nuclear Fuel Development Corporation, both of, Japan

Filed Feb. 26, 1973, Ser. No. 335,749
Claims priority, application Japan, Feb. 25, 1972, 47-18928
Int. Cl. B01d *53/00*
U.S. Cl. 55—25 **28 Claims**

1. A process for increasing the concentration of krypton-85 in an exhaust gas containing krypton-85 comprising passing a mixture of desorbed krypton-85 obtained from a first adsorption bed and said exhaust gas into a second adsorption bed arranged in parallel with respect to said first adsorption bed until substantially all of the krypton-85 adsorbed in said first adsorption bed is transferred to said second adsorption bed, and thereafter transferring a mixture of said exhaust gas and

the krypton-85 adsorbed in said second adsorption bed to said first adsorption bed until substantially all of the krypton-85



adsorbed in said second adsorption bed has been transferred to said first adsorption bed.

3,922,151

PROCESS AND DEVICE FOR SEPARATING CONTAMINATED GAS

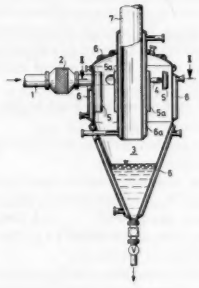
Ferenc Kiss, Dieburg; Wilhelm Grein, and Karl Zellmann, both of Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 1, 1974, Ser. No. 456,891

Claims priority, application Germany, Apr. 3, 1973, 2316570

Int. Cl.² B01D *47/00*

U.S. Cl. 55—92 **5 Claims**



1. A process for purifying contaminated gas, containing a contaminating gas vapor, from containers and installations containing substances polluting the surroundings, which process comprises passing the contaminated gas tangentially into a chamber made of a conductive material resistant to pressure shocks, grounding said chamber, tantentially introducing a chemically inert gas into the chamber in the liquid state at a lower temperature than said contaminated gas and at a position separate from the tangential introduction of said contaminated gas into the chamber, said inert gas being selected in accordance with the contaminating gas to be removed, to cause condensation and freezing of the contaminating gas upon vaporization of the inert gas, intimately mixing the contaminated gas in said chamber with said chemically inert gas, condensing and freezing the contaminating gas vapor in the contaminated gas by evaporation of the chemically inert gas in the chamber to produce a solid to separate said contaminating gas vapor from the clean gas in the contaminated gas, and then transforming the frozen contaminating solid into a flowable material state and separating the flowable contaminating gas material from the cleaned gas and the inert gas by separately removing said flowable contaminating gas material and said clean and inert gases.

3,922,152

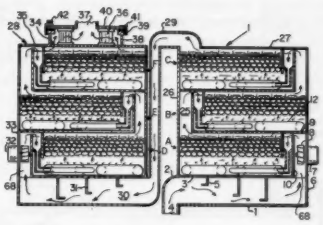
FILTER

Nick Kookoothakis, 309 - 39th St., Beaver Falls, Pa. 15010

Filed Nov. 21, 1973, Ser. No. 417,945

Int. Cl.² B01D *47/02*

U.S. Cl. 55—246 **5 Claims**



1. A multiple stage fluid filter comprising:

A. a filter housing having an inlet port for admitting fluid to be treated into the housing;

B. a plurality of filter stages within the housing and through which the fluid is adapted to pass under pressure, each filter stage comprising a chamber containing

a. an inlet channel,

b. a tubular coil having a funnel-shaped inlet in communication with the inlet channel and having openings through which the fluid is adapted to pass upwardly in the chamber,

c. a plurality of layers of porous filtering media separated by screens located in the chamber above and spaced from the coil,

d. a body of cleaning liquid filling the chamber to a liquid level above the uppermost of the layers of porous filtering media,

e. a plurality of baffles at the top of the chamber above the porous filtering media and extending at least partially into said cleaning liquid for stabilizing the liquid level during vibration of the filter housing; and

C. an outlet port in the housing in communication with the chamber of the last of the filter stages through which the fluid to be treated passes, the inlet channel of at least one stage being connected to the inlet port of the housing and the balance of the stages being connected to an adjacent filter stage chamber, whereby fluid to be treated can enter the inlet port of the housing; pass into the inlet channel of a first stage; pass into the inlet of a tubular coil therein; pass through the tubular coil and upward through the cleaning liquid and the porous filtering media and into the inlet channel of the next succeeding stage; and then pass through successive stages to the outlet port of the filter housing where it is exhausted from the filter.

3,922,153

INJECTOR TYPE LIQUID COOLING APPARATUS

John Engalitcheff, Jr., Gibson Island; Wilson E. Bradley, Jr., Ellicott City, and Edward N. Schinner, Silver Spring, all of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

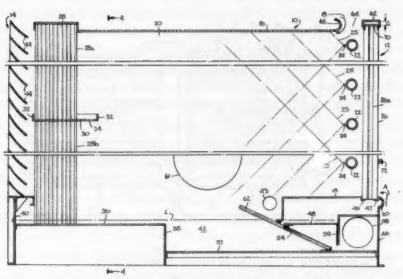
Filed Mar. 6, 1974, Ser. No. 448,758

Int. Cl. B01d *47/06*

U.S. Cl. 55—257 **25 Claims**

1. In combination with an injector type liquid cooling system which comprises an air conduit open at both ends to the atmosphere, a plurality of liquid spray nozzles positioned near one end of the conduit and distributed over its cross section, said nozzles being oriented to direct liquid sprays toward the other end of said conduit, liquid-air separator means positioned in said conduit near its said other end for intercepting the liquid sprayed by said nozzles and for causing said liquid to flow downwardly along said liquid-air separator means, a

liquid collector sump positioned below said conduit to collect liquid which flows down from the liquid-air separator means, an inlet air flow stabilizing means for maintaining a smooth eddy free flow of incoming air comprising a plurality of straight, closely spaced parallel strips of thin sheet material extending in a generally upright position and distributed over



the cross section of said one end of said conduit wholly upstream of said spray nozzles, said strips lying in planes substantially parallel to the direction of spray from said nozzles, said strips being formed with corrugations extending along their length to provide liquid-air separation in the event of fluid blowback out through said one end of the conduit

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3,922,154

METHOD FOR PURIFICATION OF SODIUM HYDROXIDE

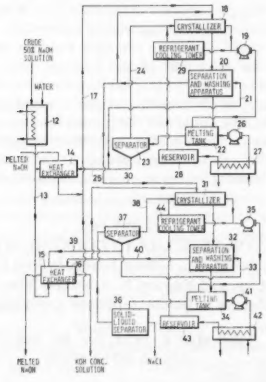
Shigetake Kawasaki, Isehara; Masaru Owa, Hino; Ichiro Hayano, Ashigara Kamigun; Takaji Akiya, Yokohama; Norio Takeuchi, Ischara; Totaro Goto, Kokubunji, and Seiichi Ishizaka, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 395,072

Claims priority, application Japan, Sept. 11, 1972, 47-90314

Int. Cl.[2] C01D *1/30;* **B01D** *9/04;* **C01D** *1/32*

U.S. Cl. 62—58 **9 Claims**



1. A method for the manufacture of purified sodium hydroxide, comprising the steps of bringing crude sodium chloride-containing aqueous solution of caustic alkali into direct contact with a refrigerant stable against said aqueous solution, thereby cooling said aqueous solution to a temperature below 15°C. by virtue of the heat of vaporization of said refrigerant, and consequently inducing precipitation of 3.5-hydrated sodium hydroxide crystals in said aqueous solution, and thereafter separating said crystals from the resultant solution by solid-liquid separation treatment.

3,922,155

PROCESS OF MAKING BIOCOMPATIBLE GLASS CERAMIC

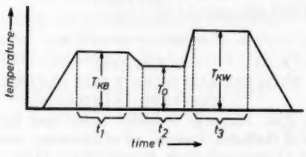
Heinz Broemer, Hermannstein; Hans-Herbert Kaes, Wetzlar-Dorlar, and Emanuel Pfeil, Marburg, all of Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed May 21, 1974, Ser. No. 471,891

Claims priority, application Germany, May 23, 1973, 2326100

Int. Cl.[2] C03B *32/00;* **A61F** *1/00;* **A61C** *13/00;* **C03C** *3/22*

U.S. Cl. 65—33 **12 Claims**



1. In a process of producing a biocompatible glass ceramic material, the steps which comprise

1. melting down a mixture essentially consisting, in weight percent, of
   about 20 to about 60 percent of silicon dioxide SiO_2,
   about 2.7 to about 20 percent of sodium oxide Na_2O,
   about 0.4 to about 20 percent of potassium oxide K_2O,
   about 2.9 to about 30 percent of magnesium oxide MgO,
   about 5 to about 25 percent of calcium oxide CaO, and
   about 10 to about 30 percent of calcium orthophosphate $Ca_3(PO_4)_2$:
2. cooling the resulting melt at least to the temperature of the following step; and
3. subjecting the cooled melt to the following temperature-time ceramization program:
   a. Heating the resulting molten and cooled glass to the temperature (T_{KB}) of optimum speed of crystal formation between about 550° C. and about 950° C. and maintaining said temperature (T_{KB}) for between about 8 hours and about 30 hours;
   b. reducing the temperature of the mixture to a temperature (T_O) between about 350°C. and about 550°C. and maintaining said temperature (T_O) for between about 2 hours and about 5 hours;
   c. increasing the temperature of the mixture to the temperature (T_{KW}) of optimum rate of crystal growth between about 700°C. and about 1,150°C. and maintaining said temperature (T_{KW}) for between about 10 hours and about 40 hours; and
   d. cooling the mixture to room temperature.

3,922,156

GLAZING APPARATUS

John Martin, Monterrey, Mexico, assignor to Fabricacion de Maquinas, S.A., Monterrey, Mexico

Filed Dec. 23, 1974, Ser. No. 535,195

Int. Cl.[2] C03B *29/00*

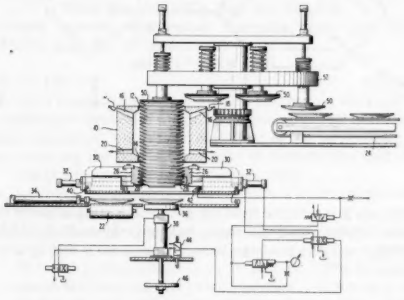
U.S. Cl. 65—272 **9 Claims**

1. Glazing apparatus for the removal of mold match marks from the rim of press molded glass ware comprising:

an elongated housing of refractory material having aligned openings at the top and bottom to allow a stack of ware to be advanced upwardly therethrough and of sufficient length to accomodate a plurality of ware arranged in a stack for treatment therein;

means positioned below and spaced from said housing for supporting a stack of ware to be treated so that a part of said stack is within said housing;

means for adding ware one at a time to the lower end of said stack and for elevating said stack by a corresponding amount;



means for removing ware one at a time from the upper end of said stack in timed relation to said means for adding; and

means for subjecting the rims of said ware within said housing to products of combustion and to radiant heat from said refractory material.

3,922,157

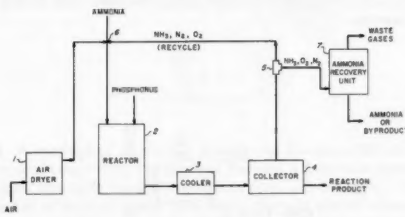
PRODUCTION OF NITROGEN-PHOSPHORUS COMPOUNDS

Harry T. Lewis, Jr., and John G. Getsinger, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 341,908, March 16, 1973. This application Oct. 9, 1973, Ser. No. 404,233

Int. Cl.[2] C05B 7/00

U.S. Cl. 71—34 **9 Claims**



1. A single-stage vapor phase reaction process involving ammonia, oxygen, and elemental phosphorus for the production of unusually high analysis nitrogen-phosphorus compositions eminently suitable for use as fertilizer material comprising the steps of:

1. simultaneously introducing vapors of ammonia, oxygen, and elemental phosphorus into a single-stage tubular reaction zone, said single-stage tubular reaction zone having a maximum surface area:volume ratio of about 0.8 in^2/in^3;
2. maintaining in said single-stage tutular reaction zone a temperature in the range of greater than about 400° and less than about 1350°F;
3. controlling and proportioning the introduction of said vapors of ammonia, oxygen, and elemental phosphorus into said single-stage tubular reaction zone to maintain therein (a) an excess of oxygen in the range from greater than about 120 percent up to about 800 percent (all percents by weight) of that required to yield a O_2:P_4 mole ratio of 5, and (b) a quantity of ammonia in the range from greater than about 50 and less than about 80 percent of that required to yield a N:P atomic ratio of 2;
4. maintaining the residence time of said vapors of ammonia, oxygen, and elemental phosphorus in said single-stage tubular reaction zone in the range from greater than about 0.1 second to less than about 4 seconds; and
5. withdrawing the resulting reaction product from said single-stage tubular reaction zone and collecting said product withdrawn from said reaction zone as a substantially nonhygroscopic, amorphous, white, particulate solid nitrogen-phosphorus product having a predetermined solubility in water and containing a N:P_2O_5 weight ratio in the range from about 0.19 to about 0.23.

3,922,158

METHOD FOR INHIBITING THE GROWTH OF DICOTYLEDONOUS PLANTS

Henry Martin, Basel; Jacques Rufener, Rheinfelden, both of Switzerland, and Georg Pissiotas, Lorrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 223,041, Feb. 2, 1972, abandoned, which is a division of Ser. No. 783,133, Dec. 11, 1968, Pat. No. 3,658,892. This application Feb. 14, 1974, Ser. No. 442,553

Int. Cl.[2] A01N 5/00

U.S. Cl. 71—76 **3 Claims**

1. A method for retarding the growth of soya plants which comprises supplying to said plants an effective non-phytotoxic amount of o-phthalic-acid-3'-trifluoromethyl-anilide or the sodium salt thereof.

3,922,159

METHOD OF IMPROVING THE PICKABILITY AND THE RIPENING OF FRUIT, AND PREPARATION FOR USE IN THIS METHOD

Jasper Daams, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 15, 1973, Ser. No. 370,381

Claims priority, application Netherlands, June 23, 1972, 7208611

Int. Cl.[2] A01N 9/12

U.S. Cl. 71—90 **3 Claims**

1. A method of improving the pickability and ripening of fruit said method comprising treating unripened fruit with a preparation containing as the active substance 4-oxyacetic acid-5-methyl-7-chloro-benzthiadiazole-2,1,3, in an amount effective to improve the pickability and ripening of fruit, and a finely divided inert carrier material therefore.

3,922,160

ISOTHIAZOLE DERIVATIVES

David Buttimore, Benfleet, England, assignor to May & Baker Limited, Essex, England

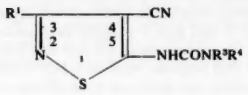
Division of Ser. No. 241,833, April 6, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,192

Claims priority, application United Kingdom, Apr. 7, 1907, 9019/07

Int. Cl.[2] A01N 9/12

U.S. Cl. 71—90 **23 Claims**

1. A method of controlling the growth of weeds in an area used for growing a crop of groundnuts which comprises applying to the area an effective amount of a herbicidal composition containing an isothiazole of the formula:



wherein R^1 represents a straight- or branched-chain alkyl group containing from 1 to 3 carbon atoms, and R^3 and R^4, which may be the same or different, are each methyl or ethyl or a salt of such an isothiazole with an alkali metal or a strong organic base, at a rate sufficient to control the growth of weeds without causing substantial damage to the groundnuts.

3,922,161

NOVEL HERBICIDAL COMPOSITIONS

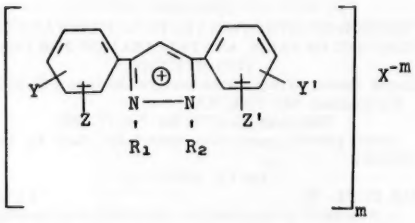
Bryant Leonidas Walworth, Pennington, and Erwin Klingsberg, Mountain Side, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 307,672, Nov. 17, 1972, which is a continuation-in-part of Ser. No. 271,424, July 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 209,448, Dec. 17, 1971, abandoned. This application Apr. 5, 1974, Ser. No. 458,367

Int. Cl.² A01N 9/22

U.S. Cl. 71—92 **18 Claims**

1. A method for the control of undesirable plant species comprising applying to the foliage of said undesirable plants a herbicidally effective compound having the formula:



wherein R_1 and R_2 each represent lower alkyl groups having one to four carbon atoms; Y, Y′, Z and Z′ each independently represent a member selected from the group consisting of hydrogen, halogen, nitro, alkyl C_1–C_4, haloalkyl C_1–C_4, and alkoxy C_1–C_4; X represents an anion with a charge of from 1 to 3; and *m* is an integer selected from 1, 2 and 3 in a herbicidally effective amount.

3,922,162

2-ALKYL-4-ARYL-1,2,4-TRIAZOLIDIN-3-ONES

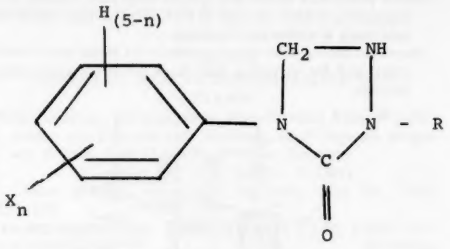
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 455,710, March 28, 1974. This application Feb. 18, 1975, Ser. No. 545,652

Int. Cl.² A01N 9/22

U.S. Cl. 71—92 **2 Claims**

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein X is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, chloroalkyl, trifluoromethyl and nitro; *n* is an integer from 1 to 3; and R is lower alkyl.

3,922,163

ORGANIC COMPOUNDS AND PROCESS

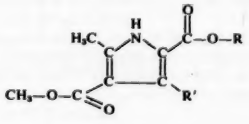
Allen R. Church, Kalamazoo, Mich., and Gerhard A. Huppi, Greifensee, Switzerland, assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 7,227, Jan. 30, 1970, abandoned. This application Nov. 23, 1970, Ser. No. 92,285

Int. Cl.² A01N 9/22

U.S. Cl. 71—95 **24 Claims**

1. The method of controlling weeds and growth of plants which comprises contacting germinating weed seeds, weed seedlings, and growing plants with a herbicidal and plant growth influencing amount of a 4-methyl-2-variable diester of 5-methyl-3-variable′-2,4-pyrroledicarboxylic acid having the formula:



wherein the variable R is alkyl of from 2 to 12 carbon atoms, inclusive; haloalkyl of from 2 to 12 carbon atoms, inclusive; alkenyl of from 3 to 8 carbon atoms, inclusive; haloalkenyl of from 3 to 8 carbon atoms, inclusive; cycloalkyl of from 3 to 6 ring atoms, inclusive; alkyl or halogen substituted cycloalkyl of from 4 to 12 carbon atoms, inclusive; cycloalkenyl of from 4 to 6 ring atoms, inclusive; alkyl or halogen substituted cycloalkenyl of from 5 to 12 carbon atoms, inclusive; cycloalkyl or cycloalkenyl substituted lower-alkyl of from 4 to 12 carbon atoms, inclusive; and alkoxy substituted lower-alkyl having a total of from 3 to 9 carbon atoms, inclusive; and the variable R′ is hydrogen, methyl (except when R is ethyl), ethyl, propyl, isopropyl, butyl, isobutyl, sec-butyl, tert-butyl, and the same halolower-alkyl.

3,922,164
TREATMENT OF ILMENITE

Allen Forrest Reid, Hawthorn, and Hari Narayan Sinha, Surrey Hills, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell and Murphyores Incorporated Pty., Ltd., Brisbane, both of, Australia

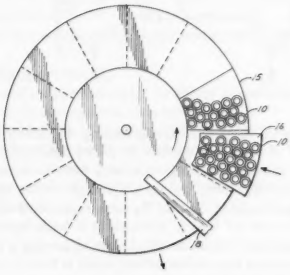
Filed Jan. 24, 1974, Ser. No. 436,238
Claims priority, application Australia, Jan. 25, 1973, 2035/73; Aug. 24, 1973, 4627/73
Int. Cl.² C22B *3/00*
U.S. Cl. 75—1 **4 Claims**

1. In an ilmenite upgrading process comprising the steps of:
a. oxidizing the ilmenite to convert substantially all of the iron values associated with titanium therein to the ferric state;
b. reducing the oxidized ilmenite to convert the said iron values substantially to the ferrous state;
c. leaching the reduced material with a hydrochloric acid solution;
the improvement which comprises carrying out the leaching step with a solution containing at least 15% by weight of HCl and ferrous chloride in an amount sufficient to increase the leaching rate of said solution to a rate in excess of that of 20% HCl under comparable reaction conditions.

3,922,165
METHOD FOR DIRECT REDUCTION OF IRON ORE USING SLEEVE-SHAPED BRIQUETTES

Louis Meade Harker, and Thomas Valle, both of Carbondale, Colo., assignors to Jaconvel Company, Carbondale, Colo.

Filed Aug. 16, 1974, Ser. No. 498,072
Int. Cl.² C21B *13/00*
U.S. Cl. 75—36 **10 Claims**



1. A method of producing iron by the direct reduction of iron ore, comprising the steps of forming a prismatic sleeve-shaped briquette from a mixture of iron ore having an iron content of at least about 60% and a particle size of about 8 mesh or smaller, a carbonaceous reducing agent having a particle size of 100 mesh or smaller in an amount of between about 15 and about 20% by weight of the iron ore, and an aqueous starch base sodium chloride containing binder in an amount of between about 3 and about 8% by weight of the iron ore, with said sleeve-shaped briquette having at least one generally vertical passage therethrough, and said briquette further having defined in at least one end thereof a plurality of notches; arranging a plurality of said sleeve-shaped briquettes on a moving table of a direct-fired furnace with said briquettes arranged in an axially upright position and with the notched ends thereof on said table and with the passage extending vertically upwardly; and subjecting said briquettes directly to furnace gases at a temperature of between about 2000° and about 2400° F. for a period of time between about 20 and 35 minutes, thereby to directly reduce a substantial portion of the metallic iron oxide to free iron; while said moving table carrying said briquettes slowly rotates through the furnace and removing said reduced briquettes from said furnace and cooling the briquettes to a temperature of about 200° F. or below in a nonoxidizing atmosphere.

3,922,166
ALLOYING STEEL WITH HIGHLY REACTIVE MATERIALS

Peter J. Koros, Pittsburgh, Pa., and Jerry Silver, Cleveland Heights, Ohio, assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

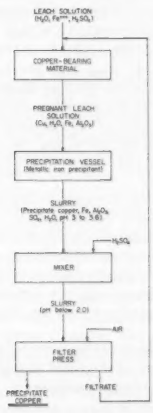
Filed Nov. 11, 1974, Ser. No. 522,391
Int. Cl.² C21C *7/00*
U.S. Cl. 75—58 **30 Claims**

1. A method of incorporating a highly reactive material into molten steel, comprising:
a. deoxidizing a steel bath in a container to kill said steel;
b. adding an alkaline earth-reactive material mixture to said killed steel bath at a sub-surface bath location, said alkaline earth-reactive material mixture containing an effective amount of alkaline earth to stir the steel bath so as to obtain a substantially uniform alloyed distribution of the reactive material throughout said killed steel bath; and
c. teeming a stream of reactive material containing steel from said container, while surrounding the stream with a gaseous reducing atmosphere, into an air containing mold have a reducing gas generating material on its bottom so that, upon contact with the reactive material containing steel, said reducing gas generating material is vaporized so as to purge air from the mold and to create a gaseous reducing mold atmosphere.

3,922,167
ACIDIFICATION OF PRECIPITATE COPPER SLURRY PRIOR TO FILTRATION AND DRYING

Albert D. Pernichele, Oakton, Va., and William D. Southard, Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,025
Int. Cl.² C22B *15/12*
U.S. Cl. 75—109 **6 Claims**



1. In the process of filtering precipitate copper from aqueous slurries containing dissolved copper values and having a pH of greater than 2, wherein a filter cake is formed and air is blown through the filter cake for drying, the improvement which comprises adding sulfuric acid to the slurry to reduce its pH to between about 0.5 and about 2 prior to the filtration and drying, whereby the drying of the filter cake is facilitated and a low moisture filter cake is produced.

3,922,168
INTERMETALLIC COMPOUND MATERIALS

James Edward Restall, Frimley, and Michael James Douglas Weaver, Fleet, both of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 256,026, May 23, 1972. This application Jan. 10, 1974, Ser. No. 432,392
Claims priority, application United Kingdom, May 26, 1971, 17150/71; Jan. 12, 1973, 1676/73
Int. Cl.² C22C *19/05*
U.S. Cl. 75—171 4 Claims

1. In an intermetallic compound material based on trinickel aluminide consisting essentially of constituents in proportion by atomic percent:

first constituents 72–83% wherein the elements are present in the range, in atomic percent,

Nickel	60–80
Chromium	2–6
cobalt	0–12
Molybdenum	0–3
Tungsten	0–3

second constituents 17-28% wherein the elements are present in the range, in atomic percent

Aluminum	12–26
Titanium	0–12
Niobium	0–6
Tantalum	0–6

said aluminum partly replaced by at least one of the elements selected from the group consisting of titanium, niobium and tantalum, the improvement which comprises including from 0.5 to 6 atomic percent hafnium in said second constituents

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3,922,169
PHOTOELECTRIC AND ELECTROPHOTOGRAPHIC PIGMENTS COMPRISING DERIVATIVES OF CONDENSED POLYCYCLIC AROMATIC HYDROCARBON ALDEHYDES

John Alf Bergfjord, Macedon; Steven James Grammatica, Webster, and Richard William Radler, Marion, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

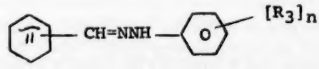
Division of Ser. No. 337,787, March 5, 1973. This application Sept. 25, 1974, Ser. No. 508,966
Int. Cl.² 204 *181;* G03G *13/24, 5/04;* B44C *1/04*
U.S. Cl. 96—1 PE 2 Claims

1. A method of photoelectrophoretic imaging comprising:

a. providing a layer of an imaging suspension comprising electrically photosensitive particles in an insulating liquid between at least two electrodes, at least one electrode being at least partially transparent;

b. exposing said suspension to a pattern of electromagnetic radiation to which at least a portion of said particles are sensitive and,

c. applying an electrical field across said suspension until an image made up of migrated particles is formed, said suspension comprising particles of a pigment having the formula:



wherein:

represents a condensed polycyclic aromatic group having from about 14 to about 20 carbon atoms;

R_3 is selected from the group consisting of: H, OH, CH_3, OCH_3, C_2H_5, OC_2H_5, $COCH_3$, CO_2CH_3, COC_2H_5, $CO_2C_2H_5$, NO_2, CN, SO_2NH_2, $SO_2NHC_6H_5$, Cl, F, Br, I; and

n is a positive integer from 1–3.

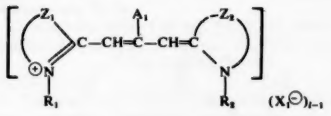
3,922,170
SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Keisuke Shiba, and Akira Sato, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 20, 1973, Ser. No. 381,137
Claims priority, application Japan, July 20, 1972, 47-72735
Int. Cl.² G03C *1/14*
U.S. Cl. 96—124 9 Claims

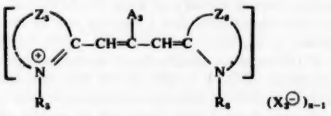
1. A silver halide photographic emulsion which is spectrally sensitized so that it has a maximum sensitivity wave length within the region of 580 nm – 640 nm, characterized by containing in a supersensitizing amount the combination of:

at least one carbocyanine dye represented by general formula (I) and at least one dye represented by general formula (III):



(I)

wherein Z_1 represents the grouping necessary for the formation of β-naphthothiazole or β-naphthoselenazole ring, Z_2 represents the grouping necessary for the formation of benzoxazole ring, A_1 represents a hydrogen atom, an alkyl radical, or an aryl radical, R_1 and R_2 each represents an alkyl radical, at least one of which represents a hydroxyalkyl radical, a carboxyalkyl radical or alkyl radical having a sulfo group, x_1 represents an acid anion group, and *l* is 1 or 2, the dye forming an intramolecular salt when *l* is 1:



(III)

wherein Z_3 represents the grouping necessary for the formation of a benzoxazole or benzimidazole ring, Z_4 represents the grouping necessary for the formation of a benzothiazole, benzoselenazole or β-naphthothiazole ring, when Z_4 is a benzimidazole ring and Z_4 represents the grouping necessary for the formation of a benzothiazole or benzoselenazole ring when Z_3 is a benzoxazole ring, A_3 represents a hydrogen atom, an alkyl radical having less than three carbon atoms or an aryl radical, R_3 and R_4 each represents an alkyl radical, at least one of which represents a hydroxyalkyl radical, a carboxyalkyl radical or an alkyl radical having a sulfo group, X_3 represents an acid anion group, and *n* is 1, the dye forming an intramolecular salt when *n* is 1.

3,922,171

CORRECTING AGENT FOR PHOTOMECHANICALLY PRODUCED PRINTING

Roland Palmer, Wiesbaden-Klarenthal, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Dec. 27, 1973, Ser. No. 428,756

Claims priority, application Germany, Dec. 29, 1972, 2263957

Int. Cl.² C09D *11/02*

U.S. Cl. 106—23 2 Claims

1. A correcting agent for photomechanically produced printing forms consisting essentially of

10 to 30 per cent by weight of 2-methoxyethanol or 2-ethoxyethanol, or a mixture of both,

10 to 30 per cent by weight of methyl isobutyl ketone, ethyl isobutyl ketone, or 2,4-dimethyl pentanone (-3), or a mixture of two or all of these ketones,

5 to 20 per cent by weight of dimethyl sulfoxide,

10 to 20 per cent by weight of benzyl alcohol,

10 to 20 per cent by weight of phosphoric acid containing 15 per cent by weight of water,

0 to 7 per cent by weight of water, in addition to the water contained in the 85 per cent phosphoric acid,

0 to 10 per cent by weight of glycerol,

0 to 20 per cent by weight of finely divided silica, and

0 to 0.1 per cent by weight of a dyestuff.

3,922,172

HIGH-ALUMINA CEMENT

Oliver W. Crinkelmeyer, Tulsa, and Earl F. Morris, Wagoner, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 7, 1974, Ser. No. 431,270

Int. Cl.² C04B 7/*32*

U.S. Cl. 106—104 4 Claims

1. A hydraulic cement composition comprising, as percent by weight:

a. a high-alumina cement,

b. calcium sulfate from about 5 to about 30 percent, based on the weight of high-alumina cement,

c. water, from about 35 to about 50 percent based on the total weight of (a) and (b), and

d. a halide salt selected from the group consisting of NaCl, KCl, from about 5 to about 15 percent, based on the weight of water.

3,922,173

TEMPERATURE-STABLE AQUEOUS GELS

Marvin D. Misak, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed July 22, 1974, Ser. No. 490,460

Int. Cl.² C08L *1/28*

U.S. Cl. 106—194 11 Claims

1. A method for producing a gradual reduction in viscosity of an aqueous gel said method consisting essentially of incorporating t-butyl hydroperoxide in said aqueous gel in a concentration sufficient to produce a complete break of said gel within about 24 hours at a temperature of up to about 300°F, wherein said aqueous gel consists essentially of

an aqueous liquid, comprising a water-alcohol solution having in the range of about 0 to 100 percent alcohol by volume of solution;

a gelling agent selected from galactomannan gums and derivatives thereof, glucomannan gums and derivatives thereof, and cellulose derivatives having molecular weights of at least about 100,000; and, optionally,

a suitable crosslinking agent present in a concentration in the range of 0 to about 0.5 percent by weight of said aqueous liquid.

3,922,174

ELECTROCHEMICAL CELL

Adam Heller, Sharon, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 22, 1973, Ser. No. 325,467

Int. Cl. H01m *35/00*, *43/06*

U.S. Cl. 136—6 LN 19 Claims

1. An electrochemical cell comprising an alkali metal anode; a cathode material selected from the group consisting of gold, carbon and an intercalation compound represented by the formula $(C_4F)_n$ where n refers to a large, but indefinite, number of recurring (C_4F) groups in said intercalation compound; an electrolyte comprising an inorganic solvent selected from the group consisting of phosphorus oxychloride, thionyl chloride, sulfuryl chloride, and mixtures thereof, and a solute dissolved in said solvent; said anode, cathode and electrolyte being housed in a casing fabricated from titanium or a titanium alloy; said cathode material catalytically decomposing said solvent during cell operation whereby said solvent is utilized as the oxidizing cathode component.

3,922,175

PLURAL CELL BATTERY

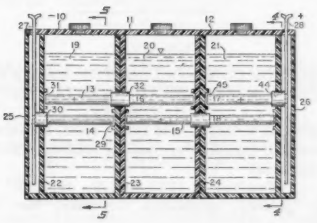
Carl-Erik Granqvist, Lindingo, Sweden, assignor to Aktiebolaget Tudor, Stockholm, Sweden

Continuation-in-part of Ser. No. 207,304, Dec. 13, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,510

Claims priority, application Sweden, Dec. 14, 1970, 16845/70

Int. Cl. H01m *35/00*

U.S. Cl. 136—6 A 17 Claims



1. In a battery having a plurality of cells with each cell having an electrolyte, an electrode for said cell including a tubularly shaped member comprising an elongated support core of synthetic plastic insulating material extending along the axis of the tubularly shaped member surrounded by active material, and a plurality of current conducting members imbedded in the active material, said current conducting members extending along the axis of the core and being spaced from the outer surfaces of said core.

3,922,176

ELECTROCHEMICAL CELLS HAVING A LIQUID ALKALI METAL ELECTRODE

Graham Robinson, Tarvin Chester, and Ivor Wynn Jones, Chester, both of England, assignors to The Electricity Council, London, England

Filed Jan. 2, 1974, Ser. No. 430,363

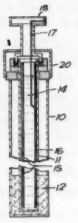
Claims priority, application United Kingdom, Jan. 3, 1973, 396/73

Int. Cl. H01m *35/00*

U.S. Cl. 136—6 FS 12 Claims

1. An electrochemical cell having a solid electrolyte between a liquid alkali metal anode electrode in an anode chamber and a cathodic reactant in a second chamber, wherein the anode chamber includes means providing a surface adjacent to and substantially uniformly spaced from the surface of said electrolyte to form a capillary region between said surfaces,

said anode chamber further including a reservoir for said liquid alkali metal, said reservoir being located adjacent to and opening into said capillary region along at least one edge of the capillary region.



3,922,177

METHOD FOR CONTROLLING THE WATER BUDGET OF RECHARGEABLE METAL-AIR CELLS AND METAL-IR BATTERIES

Dieter Groppel, Erlangen, and Dieter Kuhl, Bubenreuth, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 6, 1973, Ser. No. 413,219

Claims priority, application Germany, Nov. 9, 1972, 2254885

Int. Cl.² H01M *8/18*

U.S. Cl. 136—86 **8 Claims**

1. A method for controlling the water budget of rechargeable metal-air cells and batteries of the type having an aqueous electrolyte comprising:

a. using as air electrodes, electrodes having a hydrophobic layer on the gas side; and

b. at least partially covering said hydrophobic layer with water for at least a portion of the charging phase whereby water vapor will diffuse into the electrolyte through the gas filled pores of the hydrophobic layer due to the vapor pressure gradient.

3,922,178

ALKALINE BATTERY SEAL AND PROTECTIVE COATING COMPRISING A FATTY ACIDAMIDE

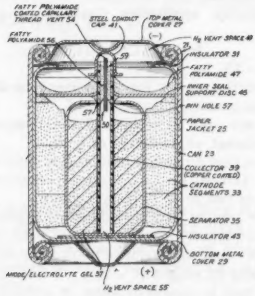
Jerrold Winger, Elyria, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 167,678, July 30, 1971, abandoned. This application Aug. 28, 1973, Ser. No. 392,222

Int. Cl. H01m *1/02*

U.S. Cl. 136—133 **15 Claims**

1. A galvanic cell comprising a container having an alkaline electrolyte therein, said galvanic cell having at least one surface subject to wetting by said alkaline electrolyte and wherein at least a portion of said surface where such wetting is not desired consists of a mixture of a fatty polyamide having an amine number above about 10 and at least one modifier thereby substantially preventing creeping of said electrolyte over or through said portion of said surface.



3,922,179

METHOD OF COATING A CHROMIUM-NICKEL COMPONENT WITH A CHROMIUM OXIDE-CONTAINING LAYER, AND COMPONENT HAVING SUCH A LAYER

Theodorus Hendrikus Weekers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,585

Claims priority, application Netherlands, Dec. 8, 1972, 7216664

Int. Cl.² C23C *11/00*

U.S. Cl. 148—6.3 **7 Claims**

1. A method of covering a component of an electron discharge tube consisting essentially of a chromium-nickel alloy with a chromium oxide-containing layer which is resistant to paling in a vacuum, comprising the steps of heating said component in a dry hydrogen atmosphere to clean the surface thereof; heating said component in air at a temperature of approximately 600° to 900°C for about 15 to 45 minutes; heating said component in a moist hydrogen atmosphere to reduce the nickel oxide and subsequently incorporating the thus treated said component in the discharge tube.

3,922,180

METHOD FOR OXIDATION-HARDENING METAL ALLOY COMPOSITIONS, AND COMPOSITIONS AND STRUCTURES THEREFROM

Edward Oscar Fuchs, Union, and James Howe Swisher, Stirling, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 24,678, April 1, 1970. This application Feb. 15, 1972, Ser. No. 226,544

Int. Cl. C22f *1/08*

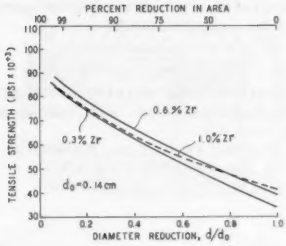
U.S. Cl. 148—11.5 R **3 Claims**

1. The method for producing an electrically conductive wire which method comprises:

solidifying a molten alloy of copper and from about 0.1 weight percent to about 1.0 weight percent of zirconium into a body in which said copper forms a first solid phase and said zirconium is present in an amount which forms a second solid phase of $ZrCu_3$,

mechanically working said body to a reduction in cross-sectional area whereby said second phase is dispersed as discrete particles within said first phase,

maintaining said mechanically worked body at a temperature of at least 700°C but below the melting point of the alloy in an atmosphere containing oxygen at a partial



pressure between 10^{-5} and 10^{-10} atmospheres until oxidation hardening of the body has occurred over essentially the entire cross-section of said body, and drawing said body into wire of a reduced cross-sectional area.

3,922,181

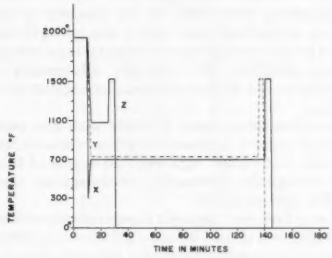
THERMAL TREATMENT OF STEEL

John E. Woodilla, Jr.; Gordon W. Hunt, both of Torrington, and Willard B. Green, Jr., Harwinton, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 254,454, May 18, 1972, Pat. No. 3,826,694. This application May 9, 1974, Ser. No. 468,495

Int. Cl.² C21D 1/46

U.S. Cl. 148—15 **1 Claim**



1. A method of producing a case having a structure with an ultra-fine grain size free from microcracks with very small well dispersed excess carbides on carburized steel comprising the steps of:

carburizing at a temperature not exceeding the solidus,

quenching quickly into a suitable liquid quench medium to the approximate temperature range of 900° to 1333°F to produce pearlite, and, when the pearlite transformation is complete,

rapidly heating through the $A_{1,3}$ and A_{cm} temperature range of the equilibrium diagram of the carburized case to the austenitizing temperature for the material for a controlled time only sufficient to convert the carbide lamellae within the pearlite into very small excess carbides and transform the ferrite to austenite, and,

quenching to harden the case.

3,922,182

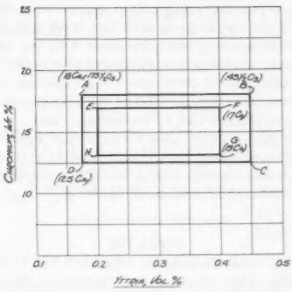
ALLOY ADAPTED FOR FURNACE COMPONENTS

Howard Francis Merrick, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,887

Int. Cl.² C22C 19/05

U.S. Cl. 148—32 **4 Claims**



1. A cold worked dispersion strengthened mechanically alloyed composition suitable for use in the fabrication of components for high temperature furnaces and consisting essentially of from about 12.5 to 20% chromium, a small but effective amount of yttria sufficient to enhance the strength characteristics of the alloy, the upper level being up to 0.45% by volume, up to 1% aluminum, up to 1% titanium, up to 0.1% carbon, and the balance essentially nickel.

3,922,183

LUBRICATING COATING FOR METAL SHEET

Richard E. Woehrle, Berkley, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 158,511, June 30, 1971, abandoned. This application Jan. 2, 1973, Ser. No. 320,642

Int. Cl.² C25D 9/02, 9/08, 9/10

U.S. Cl. 148—31.5 **1 Claim**

1. An article having a film imparting lubricity and abrasion resistance thereto containing 0.1 milligrams to 100 milligrams of occluded surfactant and 3 milligrams to 300 milligrams of trivalent chromium oxide per square meter of treated surface said surfactant being selected from the group consisting essentially of organic sulfonic acids exhibiting from 6 to 30 carbon atoms, the sodium and potassium salts of said sulfonic acids, and the mixed sodium and potassium salts and organic disulfonic and trisulfonic acids.

3,922,184

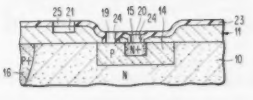
METHOD FOR FORMING OPENINGS THROUGH INSULATIVE LAYERS IN THE FABRICATION OF INTEGRATED CIRCUITS

Theodore H. Baker, Wappingers Falls, and Majid Ghafghaichi, Poughkeepsie, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,887

Int. Cl.² H01L 21/308

U.S. Cl. 156—11 **5 Claims**



1. In the fabrication of integrated circuits, a method of forming openings through an insultative layer comprising:

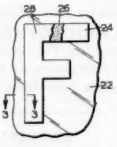
forming a layer of electrically insulative material on a substrate,
covering said layer with a first photoresist mask having a plurality of openings,
forming, by a chemical etching step through said openings in said photoresist mask, a plurality of openings through said insulative layer coincident with said mask openings, removing said first photoresist mask,
forming directly on said layer, a second photoresist mask having a plurality of openings coincident with the positions of the openings in said first mask and at least one additional opening not coincident with any of said positions, said openings in said second photoresist mask having smaller lateral dimensions than the openings in said first mask whereby the sides of the openings in the insulative layer are masked by photoresist, and
repeating said etching step through said openings in said second mask for a period sufficient to etch an opening through said insulative layer which is coincident with said at least one additional mask opening.

3,922,185

APPLYING ART WORK TO MOTION PICTURE FILM

Eric T. Amies, 1101 W. 43rd St., Vancouver, Wash. 98660

Filed July 2, 1973, Ser. No. 375,531
Int. Cl.² B44D *1/52*; G03C *1/92*; G03B *19/18*
U.S. Cl. 156—57 **3 Claims**



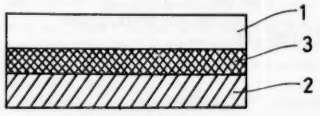
1. The method of making an article for use in superimposing an outline art work on a motion picture film having a live action background by the technique of aerial image cinematography utilizing a recording camera, the method comprising:
a. coating a transparent plate with a selected fluorescent pigment,
b. securing adhesively an outline art work to a corresponding area of the coating, thereby confining the underlying fluorescent pigment, and
c. removing the fluorescent pigment from the unconfined area of the plate.

3,922,186

METHOD FOR LINING SURFACES WITH SHEETS OF POLYVINYLIDENE FLUORIDE

Masahiro Segawa; Yukichika Kawakami, and Mitsuru Itoh, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Filed Oct. 12, 1972, Ser. No. 296,930
Claims priority, application Japan, Oct. 20, 1971, 46-82416
Int. Cl.² B32B *7/00*
U.S. Cl. 156—310 **6 Claims**



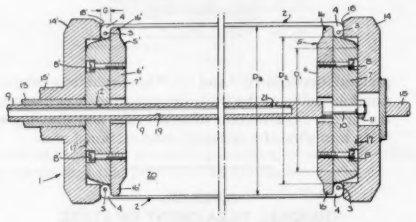
1. A method for protecting a surface from corrosion comprising:
providing a laminated sheet or sheets, said sheet or sheets comprising a glass cloth and polyvinylidene fluroide sheet having an ηinh of 0.7–1.5, said glass cloth being partially embedded in said polyvinylidene fluoride so as to leave one surface of said glass cloth exposed,
adhesively bonding said exposed surface of said glass cloth to the surface to be protected, said adhesive being applied to said exposed surface; and
hot-gas welding adjoining edges of said sheet or sheets using a welding bar of polyvinylidene fluoride having a ηinh of 0.7 to 1.3.

3,922,187

PNEUMATIC TIRE SHAPING APPARATUS

Floyd De Nardis, Harper Woods, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Oct. 19, 1973, Ser. No. 408,130
Int. Cl.² B29H *17/16*, *17/26*
U.S. Cl. 156—415 **10 Claims**



1. Apparatus for altering the shape of a raw tire carcass from a substantially cylindrical form to a substantially toroidal form, preparatory to vulcanization, said carcass having at least one cylindrically oriented elastomeric ply which terminates at its opposite ends, respectively, in a pair of bead regions of reduced diameter, said apparatus comprising:
a. a pair of coaxially spaced, disc-like, support members,
each of said support members including a first rigid element having a non-gasket-carrying periphery of a diameter corresponding substantially to the diameter of said ply when in cylindrical form, and a second rigid element affixed to said first rigid element and having a non-gasket-carrying periphery of a diameter substantially corresponding to said reduced diameter or each of said bead regions,
said support members being arranged such that each said first rigid element confronts the other in spaced relation, and each said second rigid element is spaced from the other through the intermediary of the spaced, confronting, first rigid elements,
each of said first rigid elements co-operatively with its corresponding one of said second rigid elements defining an entirely rigid shoulder means for inflexibly directly contacting, with the absence therefrom of a resilient medium, and constraining, in fluid-sealing relation, a corresponding one of the carcass bead regions thereon; and
b. means for displacing said support members coaxially toward one another to permit inflation of the fluid-sealed cylindrical ply into the form of a torus.

3,922,188

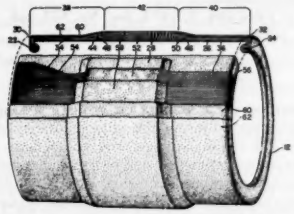
INFLATABLE MEMBRANE AND METHOD FOR SHAPING PNEUMATIC TIRES

Paul E. Appleby, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 266,886, June 28, 1972, Pat. No. 3,867,223. This application Oct. 29, 1974, Ser. No. 518,676
Int. Cl.² B29H *17/26*
U.S. Cl. 156—416 **14 Claims**

1. A generally cylindrical membrane which is expandable to a general configuration of a torus for use in manufacturing tires, said membrane comprising a central portion extending

circumferentially thereabout, two end portions extending circumferentially thereabout and disposed one each on axially opposite sides of said central portion, and a cord reinforcing



structure extending from each axially outer end of said membrane through each end portion and terminating short of said central portion.

3,922,189

DRYING OF LIQUIFORM MATERIALS

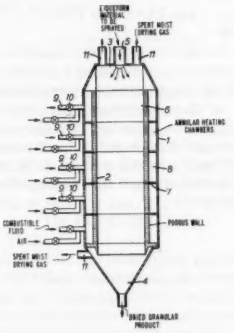
Hubertus Carolus Marie Penders, 195 Statensingel, Naastricht, Netherlands

Continuation of Ser. No. 288,729, Sept. 13, 1972, abandoned. This application July 29, 1974, Ser. No. 492,736

Claims priority, application Netherlands, Sept. 13, 1971, 7112548

Int. Cl.² B01D 1/16; F26B 3/12

U.S. Cl. 159—4 A **17 Claims**



1. A method of drying liquiform material comprising the steps of providing cylindrical porous wall means to define a drying space therewithin, providing a plurality of separate, axially contiguous, annular gas supply chambers substantially surrounding the porous wall means, to divide the space into a plurality of axially distributed and substantially contiguous drying zones, feeding the liquiform material axially into the drying space, feeding a combustible gas into at least some of the gas supply chambers, controlling the supply of gas to each chamber independently, burning the gas within the pores of the wall means to heat the wall means, feeding the gas from the wall means centripetally into the associated drying zone transversely to the axis of the drying space with the gas distributed uniformly and peripherally around the wall portion of the drying zone, withdrawing the gas from at least one end portion of the drying space and removing dried granular product from the lower end of the drying space.

3,922,190

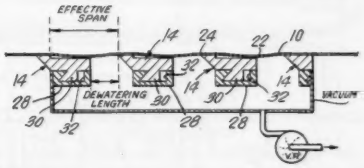
VACUUM DRAINAGE DEVICE HAVING A PLURALITY OF STEPPED BLADES

Wavell Frederick Cowan, Montreal West, Canada, assignor to Inotech Process Limited, Montreal, Canada

Continuation-in-part of Ser. No. 395,460, Sept. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 249,317, May 1, 1972, abandoned. This application Sept. 10, 1974, Ser. No. 504,804

Int. Cl.² D21F 1/48

U.S. Cl. 162—352 **21 Claims**



9. A drainage device for draining a moving forming fabric including, in combination, a first leading surface adapted to support the forming fabric disposed transverse of the direction of travel thereof, a trailing surface disposed transverse of the direction of travel of said forming fabric downstream from said first leading support surface, an intermediate surface provided between the first leading support surface and the trailing surface diverging from the plane of said leading support surface in the direction of said trailing surface at an angle exceeding 5°, a second support surface adapted to support the forming fabric disposed transverse of the direction of travel thereof and spaced downstream of said trailing surface and forming a gap therebetween, means for applying suction in said gap, said trailing surface having a depth below the first and second support surfaces and a length whereby the moving fabric is not normally supported by said trailing surface, the distance between the forming fabric and the trailing surface not exceeding a distance necessary for formation and maintenance of a hydrodynamic nip therebetween upon the application of suction by said means for applying suction which willl effectively prevent liquid from flowing between the forming fabric and the trailing surface thereby effectively limiting the drainage suction to the distance between said nip and said second support surface upon which said forming fabric is supported.

3,922,191

APPARATUS FOR MOLDING ARTICLES WITH MULTIPLE BASIS WEIGHT OR THICKNESS

Edgar C. Witt, Wilbraham, and Donald T. Daniele, Longmeadow, both of Mass., assignors to Diamond International Corporation, New York, N.Y.

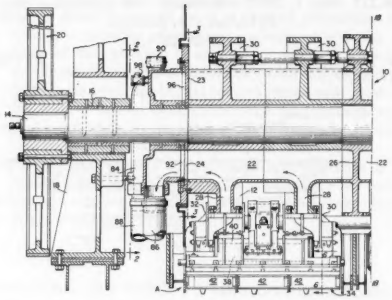
Filed May 23, 1974, Ser. No. 472,871

Int. Cl.² D21J 7/00

U.S. Cl. 162—383 **12 Claims**

11. In a molding apparatus for producing multiple basis weight pulp or foam articles, a compartmented molding die assembly comprising a plurality of die sections, each of said die sections being separated from another die section, screen means disposed over said die sections, separate chambers connecting said die sections to means for supplying vacuum whereby pulp or foam may be sucked onto said die sections and means in one of said chambers being effective to control the amount of pulp or foam sucked onto one of said die sections so as to be at a reduced basis weight, a first one of said die sections being adapted to form the pocket section of an egg carton which includes many surfaces intersecting at various angles and being connected to said means for supplying vacuum to said one of said chambers having said means therein to control the amount of slurry at a reduced basis

weight, and said means effective to control the amount of pulp or foam at a reduced basis weight in said one of said chambers



is a valve member operable to close off said means for supplying vacuum while others of said chambers remain open to said means for supplying vacuum.

3,922,192

NUCLEAR REACTOR INSTRUMENTATION

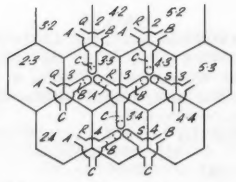
Edward Duncombe, Hale, and Gerald McGonigal, Liverpool, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 9, 1973, Ser. No. 404,241

Claims priority, application United Kingdom, Nov. 1, 1972, 50441/72

Int. Cl. G21c *17/02*

U.S. Cl. 176—19 R **4 Claims**



1. A liquid metal cooled nuclear reactor comprising a plurality of instrumented fuel element sub-assemblies through which coolant can flow upwardly and wherein there is an equal plurality of instruments for sensing the temperature and the rate of liquid metal flow of a sample of coolant derived from a group of at least three adjoining sub-assemblies, each group having a sleeve which defines a coolant flow duct and houses a sensing instrument, the sleeve having at least three inlet ducts arranged for receiving coolant flow from the central regions of each of the sub-assemblies of the group and a common outlet.

3,922,193

METHOD OF PRODUCING GUANOSINE-5′-MONOPHOSPHATE

Hitoshi Enei, Zushi; Hiroshi Matsui, Yokohama, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,466

Claims priority, application Japan, Oct. 12, 1973, 48-114486

Int. Cl.² C12D *13/06*

U.S. Cl. 195—28 N **4 Claims**

1. A method of producing guanosine-5′-monophosphate which comprises culturing the strain Corynebacterium sp. FERM-P 2312 in an aqueous culture medium containing assimilable sources of carbon and nitrogen, inorganic ions and minor organic nutrients necessary for the growth of said strain, a starting material selected from the group consisting of inosine and hypoxanthine, and phosphate ions until said starting material is converted to quanosine-5′-monophosphate, and said guanosine-5′-monophosphate accumulates in said medium, and recovering the accumulated guanosine-5′-monophosphate from said medium.

3,922,194

PROCESS FOR PRODUCING 2-KETO-L-GULONIC ACID

Takayasu Sonoyama, Sakai; Bunji Kageyama, Nagaokakyo, and Tahiko Honjo, Mino, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Mar. 19, 1974, Ser. No. 452,656

Claims priority, application Japan, Mar. 22, 1973, 48-32842

Int. Cl.² C12D *13/00*

U.S. Cl. 195—30 **16 Claims**

1. A process for producing 2-keto-L-gulonic acid or a salt thereof which comprises; contacting a 2-keto-L-gulonic acid producing strain selected from microorganisms which belong to the genera of Brevibacterium, Arthrobacter, Bacillus, Staphylococcus, Micrococcus and Pseudomonas, with 2,5-diketo-D-gluconic acid or a salt thereof, under conditions sufficient to produce 2-keto-L-gulonic acid, and recovering the produced 2-keto-L-gulonic acid or any salts thereof from the resultant mixture.

3,922,195

PROCESS FOR PREPARING L-MALIC ACID

Ichiro Chibata, Suita; Tetsuya Tosa, Kyoto; Tadashi Sato, and Kozo Yamamoto, both of Takatsuki, all of Japan, assignors to Tanabe Seiyaku Co. Ltd., Osaka, Japan

Filed Oct. 17, 1974, Ser. No. 515,689

Int. Cl.² C12D *1/02*

U.S. Cl. 195—30 **16 Claims**

1. A process for preparing L-malic acid which comprises the steps of polymerizing N,N′-lower alkylene-bis-acryloylamide, bis (acryloylamidomethyl) ether or N,N′ -di-acryloyl-ethyleneurea, or copolymerizing acryloylamide with N,N′-lower alkylene-bis-acryloylamide, bis(acryloylamidomethyl) ether or N,N′-di-acryloyl-ethyleneurea, in an aqueous suspension of a fumarase-producing microorganism to produce an immobilized fumarase-producing microorganism, and subjecting the immobilized fumarase-producing microorganism to enzymatic reaction with fumaric acid or a salt thereof.

3,922,196

ENZYMATIC HYDROLYSIS OF GRANULAR STARCH

Harry Woods Leach, Willow Brook; Ronald Emil Hebeda, Woodridge, and Dennis John Holik, Naperville, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 437,457, Jan. 28, 1974, which is a continuation-in-part of Ser. No. 349,899, April 10, 1973, abandoned. This application Oct. 8, 1974, Ser. No. 513,198The portion of the term of this patent subsequent to Dec. 25, 1992, has been disclaimed.

Int. Cl.² C12D *13/02*

U.S. Cl. 195—31 R 71 Claims

1. A process for directly converting granular starch to a soluble starch hydrolysate, comprising:

subjecting an aqueous slurry of granular starch to the action of an alpha-amylase enzyme preparation and to the action of at least one saccharifying enzyme preparation at a temperature in the range from the normal initial gelantinization temperature of the starch to the actual gelantinization temperature of the starch, at a pH of about 4 to about 7, for a period of time to enzymatically convert the granular starch to a soluble starch hydrolysate, and

recovering from said mixture the soluble starch hydrolysate, whereby any residual, non-soluble starch has substantially retained its granular, ungelantized form.

19. The process of claim **18,** wherein the alpha-amylase is derived from a *Bacillus licheniformis* strain selected from the group consisting of NCIB 8059, NCIB 8061, ATCC 6598, ATCC 6634, ATCC 8480, ATCC 9945A and ATCC 11945.

27. The process of claim **26,** wherein the alpha-amylase is derived from a Bacillus organism.

39. The process of claim **38,** wherein the alpha-amylase is derived from a *Bacillus licheniformis* strain selected from the group consisting of NCIB 8059, NCIB 8061, ATCC 6598, ATCC 6634, ATCC 8480, ATCC 9945A and ATCC 11945.

46. The process of claim **45,** wherein the conversion and solubilization is conducted at a temperature in the range of from about 60°C to about 75°C.

3,922,197

PROCESS FOR CONVERTING GRANULAR STARCH TO DEXTROSE

Harry Woods Leach, Willowbrook; Ronald Emil Hebeda, Woodridge, and Dennis John Holik, Naperville, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 349,899, April 10, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 437,101

Int. Cl.² C12D *13/02*

U.S. Cl. 195—31 R 23 Claims

1. A process for directly converting granular starch to a soluble starch hydrolysate containing dextrose, comprising:

agitating a mixture of granular starch, water, an alpha-amylase enzyme preparation and a glucoamylase enzyme preparation at a temperature in the range from the normal initial gelatinization temperature of the starch to the actual gelatinization temperature of the starch, at a pH of from about 4.0 to about 7.0, maintaining said conditions for a period of time to produce a soluble starch hydrolysate containing dextrose, and

recovering from said mixture the soluble starch hydrolysate containing dextrose, whereby any residual, non-soluble starch has substantially retained its granular, ungelatinized form.

16. A process for directly converting granular starch to a soluble starch hydrolysate containing dextrose, comprising:

agitating a mixture of granular starch, water, an alpha-amylase enzyme preparation derived from *Bacillus licheniformis* and a glucoamylase enzyme preparation wherein the starch is present at a concentration in the range from about 5% to about 40% by weight of the mixture, the alpha-amylase is present in the range from about 0.1 to about 25 units of activity per gram of starch, and the glucoamylase is present in an amount such as to provide from about 0.05 to about 5.0 units of activity per gram of starch,

converting and solubilizing the granular starch in said agitated mixture at a temperature in the range from the normal initial gelatinization temperature of the starch to the actual gelatinization temperature of the starch, maintaining said conditions for a period of time to produce a soluble starch hydrolysate containing dextrose, and

recovering from said mixture the soluble starch hydrolysate containing dextrose whereby any residual non-soluble starch has substantially retained its granular, ungelatinized form.

3,922,198

PROCESS FOR CONVERTING GRANULAR STARCH TO DEXTROSE

Edward A. Kuske, Oak Lawn, and Darius K. Przybylski, Chicago, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Jan. 28, 1974, Ser. No. 437,264

Int. Cl.² C12D *13/02*

U.S. Cl. 195—31 R 39 Claims

1. A process for directly converting granular starch to a soluble starch hydrolysate containing dextrose, comprising:

a. agitating a mixture of granular starch, water, and an alpha-amylase enzyme preparation at a temperature in the range from the normal initial gelatinization temperature of the starch to the actual gelatinization temperature of the starch, maintaining said conditions for a period of time to convert at least about 10% of the starch to a soluble starch hydrolysate,

b. adjusting the temperature to within the range from about 50°C. to about 65°C. and the pH to within the range from about 4.0 to about 4.8 and adding a glucoamylase enzyme preparation to enzymatically saccharify and further convert the soluble starch hydrolsate to a soluble starch hydrolysate containing dextrose, and

c. recovering from said mixture the soluble starch hydrolysate containing dextrose, whereby any residual, non-soluble starch has substantially retained its granular, ungelatinized form.

35. A process for directly converting granular corn starch to a soluble corn starch hydrolysate containing dextrose comprising:

a. agitating a mixture of granular corn starch, water, an alpha-amylase preparation derived from *Bacillus licheniformis* and a glucoamylase enzyme preparation, wherein the starch is present at a concentration in the range from about 10% to about 30% by weight of the mixture, the alpha-amylase is present in the range from about 1.0 to about 10 units of activity per gram of corn starch, and the glucoamylase is present in an amount such as to provide from about 0.05 to about 5.0 units of activity per gram of starch, converting and solubilizing the corn starch in said agitated mixture at a temperature in the range from the normal initial gelatinization temperature to the actual gelatinization temperature of the corn starch, at a pH of from about 4.0 to about 7.0, maintaining said conditions for a period of time until at least about 10% of the corn starch is hydrolyzed to a soluble starch hydrolysate containing dextrose,

b. adjusting the temperature within the range of from about 50°C. to about 65°C. and the pH to within the range from about 4.0 to about 4.8 and adding more glucoamylase enzyme preparation to enzymatically saccharify and further convert the soluble starch hydrolysate containing dextrose, and c. recovering from said mixture the soluble corn starch hydrolysate containing dextrose whereby any residual, non-soluble starch has substantially retained its granular, ungelatinized form.

3,922,199

ENZYMATIC HYDROLYSIS OF GRANULAR STARCH

Ronald Emil Hebeda, Woodridge; Dennis John Holik, Naperville, and Harry Woods Leach, Willowbrook, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 349,899, April 10, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 437,452

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—31 R 19 Claims

1. A process for directly converting granular starch to a soluble starch hydrolysate, comprising:

agitating a mixture of granular starch, water and an alpha-amylase enzyme preparation at a temperature in the range from the normal initial gelatinization temperature to the actual gelatinization temperature of the starch, at a pH of from about 4.0 to about 7.0, maintaining said conditions for period of time to produce a soluble starch hydrolysate, and

recovering from said mixture the soluble starch hydrolysate, whereby any residual, non-soluble starch has substantially retained its granular, ungelatinized form.

11. A process for directly converting granular starch to a soluble starch hydrolysate, comprising:

agitating a mixture of granular starch, water and an alpha-amylase enzyme preparation derived from *Bacillus licheniformis*, wherein the starch is present at a concentration in the range from about 5% to about 40% by weight of the mixture, and the alpha-amylase is present in the range from about 0.1 to about 25 units of activity per gram of starch,

converting and solubilizing the granular starch in said agitated mixture at a temperature in the range from the normal initial gelatinization temperature of the starch to the actual gelatinization temperature of the starch, maintaining said conditions for a period of time to produce a soluble starch hydrolysate, and

recovering from said mixture the soluble starch hydrolysate whereby any residual non-soluble starch is substantially retained its granular, ungelatinized from.

3,922,200

ENZYMATIC HYDROLYSIS OF GRANULAR STARCH

Raoul Guillaume Philippe Walon, Brussels, and Elie Francois Berghmans, Machelen, both of Belgium, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 18, 1974, Ser. No. 452,154

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—31 R 33 Claims

1. A process for directly converting granular starch to a soluble starch hydrolysate, comprising:

a. agitating a mixture of granular starch, water, and an alpha-amylase enzyme preparation, enzymatically solubilizing the starch in said agitated mixture at a temperature in the range from the normal initial gelatinization temperature of the starch to the actual gelatinization temperature of the starch, maintaining said conditions of enzymatic solubilization for a period of time to enzymatically convert at least about 10% of the starch to a soluble starch hydrolysate, whereby any residual, non-soluble starch from said conditions has subsiantially retained its granular, ungelatinized form;

b. heating said mixture to a temperature above the gelatinization temperature of the starch so as to gelatinize substantially all of the remaining non-soluble, ungelatinized granular starch in the mixture; and

c. adjusting the temperature to within the range from about 50°C. to about 65°C. and the pH to within the range from about 4 to about 6, and adding at least one saccharifying enzyme preparation to enzymatically saccharify and convert the heat-treated soluble starch hydrolysate, whereby the action of the saccharification enzyme preparation is conducted such as to substantially increase the dextrose equivalent value (D.E.) of the soluble starch hydrolysate.

3,922,201

PREPARATION OF LEVULOSE FROM GRANULAR STARCH

Ronald Emil Hebeda, Woodridge, and Harry Woods Leach, Chicago, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed July 12, 1973, Ser. No. 378,738

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—31 F 16 Claims

1. A process for the direct conversion of granular starch to levulose, comprising forming an aqueous slurry of granular starch, bacterial alpha-amylase, glucoamylase and glucose isomerase, at a temperature of at least about 40°C and below the temperature at which the starch is gelatinized, at a pH of from about 5 to about 7 and maintaining the conditions of temperature and pH so that the insoluble starch retains its essentially granular form while a soluble starch hydrolysate containing levulose is produced, whereby any residual insoluble starch remains in essentially granular, ungelatinized form.

12. A process for the direct conversion of granular starch to levulose, comprising forming an aqueous slurry of granular starch, a bacterial alpha-amylase enzyme preparation derived from *Bacillus lichiniformis*, a glucoamylase enzyme preparation and a glucose isomerase enzyme preparation, at a temperature of at least about 40°C and below the temperature at which the starch is gelatinized, at a pH of from about 5 to 7, maintaining these conditions during enzymatic action so that the unsolublized starch remains in ungelatinized form while a soluble starch hydrolysate containing levulose is being produced, whereby any residual insoluble starch in the conversion mixture is not gelatinized.

3,922,202

FERMENTATION PROCESS

Thomas C. Hallada, Westfield; Edward Inamine, Rahway, and Jerome Birnbaum, Morganville, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 29, 1974, Ser. No. 527,993

Int. Cl.[2] C12D *9/00*

U.S. Cl. 195—80 R 16 Claims

1. In the process for preparing cephamycin A and cephamycin B by growing a cephamycin A and cephamycin B producing specie of Streptomcyes in a nutrient medium, the improvement which comprises the addition of L-lysine, L-α-aminoadipic acid or DL-α-aminoadipic acid to the nutrient medium.

3,922,203

CULTURE MEDIA IN FILM FORMAT FOR CONDUCTING MICROBIAL ANALYSIS AND METHOD OF PRODUCING THE MEDIA AND LOADING IT INTO CASSETTES

Clifton Aldridge, Jr., Creve Coeur, and Richard D. Vannest, St. Charles, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed July 17, 1973, Ser. No. 380,070

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—103.5 9 Claims

1. A method of loading a cassette used to analyze a carrier liquid for the presence of specific microorganisms therein, said cassette having a rigid body containing a passageway which includes a plurality of viewing wells, the interiors of which are visible from outside the cassette, each viewing well initially having at least one of its ends opening outwardly through a face of the rigid body, said method comprising: placing a flexible sheet of material containing a culture medium which is selective to the said specific microorganism over the open ends of the viewing wells; forming plugs from the sheet and driving the plugs into the viewing wells substantially contemporaneously; and closing the initially open ends of the viewing wells.

3,922,204
METHOD OF MAKING CATALYST HAVING A PEROVSKITE STRUCTURE, THE RESULTING PRODUCT AND USES THEREOF

Alfred Chan Chung Tseung, and Howard Lynne Bevan, both of London, England, assignors to National Research Development Corporation, London, England

Filed Apr. 19, 1971, Ser. No. 134,988

Claims priority, application United Kingdom, Apr. 22, 1970, 19292/70

Int. Cl.² B01K *1/00;* **B01J** *23/10*

U.S. Cl. 204—1 T **7 Claims**

1. In the polarographic method for determining the oxygen partial pressure in a solution, the improvement which comprises using as oxygen electrode material in the determination a perovskite structure catalyst having the composition represented by the formula:

$$(A_xLa_{1-x})(C)O_3$$

wherein A is a cation selected from the group consisting of Sr^{++}, Ba^{++} and Ca^{++}, C is a cation of cobalt or nickel, and x is a number greater than zero and less than one.

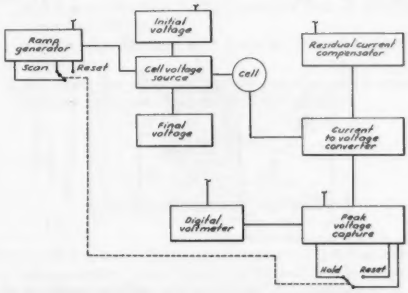
3,922,205
PORTABLE POLAROGRAPHIC ANALYZER AND QUICK POLAROGRAPHIC DETERMINATIONS

James D. McLean, Midland, and John F. Holland, Lansing, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 389,821, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 250,167, May 4, 1972, abandoned. This application Oct. 1, 1974, Ser. No. 510,964

Int. Cl.² G01N *27/48*

U.S. Cl. 204—1 T **28 Claims**



1. A special purpose polarographic instrument for the rapid repetitive quantitative determination of a polarographically reactive species in an electrolyte solution in the substantial absence of interfering substances, which consists essentially of, in combination:

a hollow non-conducting cell body in the form of a receptacle adapted to receive about 5 to 25 milliliters of sample electrolyte solution;

a fixed area working electrode positioned so as to physically and electrically contact said electrolyte solution placed in said cell;

a reference electrode adapted to be positioned extending into said cell to a sufficient depth to have the sensing end immersed in said electrolyte solution when the cell is in use;

means for supporting the said reference electrode with the sensing end thereof with the cell body;

means for electrically connecting each of the reference electrode and the working electrode, respectively, to special circuitry to make a completed operative circuit;

said special circuitry embodying (1) means for automatically impressing for a preselected time interval during each said determination, a continuous, linear scanning potential across the electrodes in the cell throughout a preselected voltage range sufficient to cause to polarographically quantitatively react species to be quantitatively determined whereby a continuous unpulsed current flows between the electrodes during said time interval, the current flow being proportional to the number of ions or molecules polarographically reacted; (2) means for automatically proportionally converting the current flow to a potential; (3) a circuit portion having peak value means including a capacitor and a diode in combination for capturing and retaining the maximum potential arising from conversion of the current flow; (4) means including a voltmeter for automatically measuring said maximum potential; and (5) means for discharging the captured and retained maximum potential.

2. The instrument as in claim **1** which employs additionally a third electrode in the form of a counter electrode and the special circuitry embodies an operational amplifier, the reference electrode and the counter electrode each being electrically connected to said operational amplifier in such a manner that the reference electrode is a non-working electrode that is relatively non-variant in potential, the current flow in the cell when in use being primarily between the working electrode and the counter electrode, the current flow resulting from the potential established between the reference electrode and the working electrode.

18. The polarographic method of quantitatively determining a polarographically reactive species on conducting sample solution in the substantial absence of interfering polarographically reactive substances which comprises:

placing in a non-conducting sample cell body from about 5 to about 25 milliliters of sample solution containing a quantity of polarographically reactive species less than an amount which exceed the linear response range of said instrument, the sample cell body having positioned therein a reference electrode and a fixed area working electrode each having the sensing end thereof immersed in said sample solution;

sweeping oxygen gas from the sample solution in the cell and providing an inert gas cover over said solution during analysis;

impressing a scanning potential between said electrodes which varies linearly with time throughout a range sufficient to cause polarographic reaction of said polarographically reactive species whereby a continuous unpulsed current flows between the electrodes;

proportionally converting the resultant current flow into a potential the maximum of which is stored by means of a circuit portion including a diode and a capacitor;

and measuring said stored potential by voltmeter means.

26. The method of rapid quantitative polarographic determination of polarographically reactive species in sample electrolyte solution containing such species in the substantial absence of interfering species which comprises:

placing about 5 to about 25 milliliters of sample electrolyte solution in a hollow non-conducting cell body having a fixed area working electrode, a fixed area counter electrode and a reference electrode each positioned therein so as to have the sensing end thereof immersed in the sample solution:

impressing a continuous linear scanning potential across each of (1) the counter electrode and the working electrode, and (2) the reference electrode and the working electrode, the reference electrode being provided with a high impedance whereby the resulting current flow is substantially between the counter electrode and the working electrode and the scan continuing until the potential as measured between the reference electrode and the working electrode is at least sufficient to cause said species to be determined to polarographically react, whereby a continuous unpulsed current flows between

the electrodes;
proportionally converting the flow to a potential the maximum of which is stored by means of a circuit portion including a diode and a capacitor;
and measuring the stored potential with a voltmeter.

3,922,206

METHOD OF PHOTO-ETCHING AND PHOTOGRAVURE USING FISSION FRAGMENT AND/OR ALPHA RAY ETCH TRACKS FROM TONED PHOTOGRAPHS

Malcolm Thackray, Sutherland, Australia, assignor to Australian Atomic Energy Commission, Coogee, Australia

Filed Dec. 28, 1973, Ser. No. 429,177

Claims priority, application Australia, Dec. 29, 1972, 1764/72; Apr. 4, 1973, 2868/73

Int. Cl. B41c *3/08;* **G03c** *5/00*

U.S. Cl. 204—6 **25 Claims**

1. The method of reproducing a photographic image on a normally non-photo-receptive surface comprising the steps of toning the photograph with substances which combine with or replace the silver grains so that the photograph emits either spontaneously or indirectly fission fragments or alpha particles in amounts related to the distribution of the silver grains in the photograph, and placing the toned photograph contiguous with the surface on which the image is to be reproduced, for sufficient time for the emissions from the photograph to reproduce the image as a radiation-damage image on the surface, the damage areas having a close positional relationship to the silver grains in the original photograph.

2. The method according to claim **1** characterized by the further step of utilising the changed chemical properties of the radiation-damage image in printing, characterized by the direct formation of an image which is ink receptive on a surface which is not normally ink receptive as when a plastic surface is maintained in close contact with a toned photograph.

3,922,207

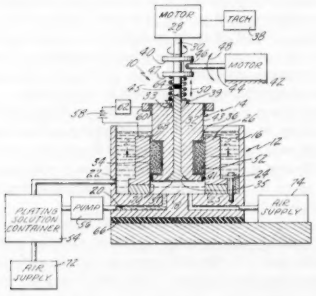
METHOD FOR PLATING ARTICLES WITH PARTICLES IN A METAL MATRIX

Orvey Preston Lowrey, Jr., Madison; Frank Walter Hammond, and Raymond Bender Slack, both of South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 31, 1974, Ser. No. 475,487

Int. Cl. C23b *7/00, 5/56*

U.S. Cl. 204—16 **13 Claims**



1. A method for applying a coating to the surface of a workpiece using a tool having an anode portion and a nonconductive abrasive surface portion, the coating including a substantially uniform distribution of particles in a metal matrix material including the steps of:

moving said abrasive surface portion relative to said workpiece surface;
maintaining said anode portion in closely spaced relationship to said workpiece surface;
flowing a plating solution of a metal salt dissolved in an aqueous solution between said workpiece surface and said abrasive surface portion and between said workpiece surface and said anode portion, said plating solution including said particles;
passing a direct electric current from said anode portion through said plating solution to said workpiece surface so that said workpiece surface is at negative potential;
maintaining a substantially uniform dispersal of said particles throughout that portion of the plating solution flow between said abrasive surface portion and anode portion and said workpiece surface; and
pressing said abrasive surface portion against said workpiece surface for at least a portion of the time that they move relative to each other with sufficient pressure to cause some of said particles which are suspended in said solution between said surfaces to become embedded in the matrix material as it is plated out, and to cause removal of roughness of any already plated matrix material without causing excessive dislodgement of particles embedded in the plated matrix material.

3,922,208

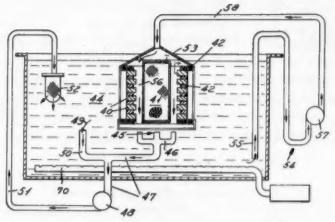
METHOD OF IMPROVING THE SURFACE FINISH OF AS-PLATED ELNISIL COATINGS

Leonard G. Cordone, Allen Park; William A. Donakowski; John R. Morgan, both of Dearborn Heights, and Karl Roemming, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 413,153, Nov. 5, 1973, abandoned. This application Mar. 6, 1974, Ser. No. 448,799

Int. Cl.² C07C *51/44;* **B01D** *3/00*

U.S. Cl. 204—16 **17 Claims**



1. A method for improving the surface condition of an electroplated metal composite containing fine inert particles, said composite being electrolytically deposited upon a cathodically constituted article juxtaposed a semi-conforming foraminous anode, both said anode and cathode article being immersed in a plating solution, the method comprising:

a. surrounding said anode with an inert screen having a mesh size greater than the average particle size of said inert particles, but effective to trap debris emminating from said anode,
b. providing a removable foraminous trap in said solution at a location remote from said anode and having a mesh size substantially equal to or smaller than the mesh of said screen but larger than the size of said inert particles,
c. positively drawing said plating solution through said screen in a direction toward the interior of said anode and thence separating said drawn solution,
d. positively passing said separated solution through said trap in a direction from the interior of said trap to the surrounding solution, said passing being carried out while bubbling gas through said trap to scrub the separated solution as it passes through the trap whereby anode

debris is continuously prevented from clogging said trap insuring the passage of said inert particles.

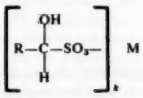
3,922,209
ELECTRODE POSITION OF ALLOYS OF NICKEL, COBALT OR NICKEL AND COBALT WITH IRON AND ELECTROLYTES THEREFOR

Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Filed Aug. 20, 1974, Ser. No. 498,947
Int. Cl.² C25D *3/56*
U.S. Cl. 204—43 T **25 Claims**

1. A process for the preparation of an electrodeposit which contains iron and at least one metal selected from the group consisting of nickel and cobalt which comprises passing current from an anode to a cathode through an aqueous acidic electroplating solution containing an iron compound and at least one member selected from the group consisting of cobalt compounds and nickel compounds providing cobalt or nickel ions for electrodepositing alloys of iron with cobalt and/or nickel and containing in combination:

1. at least one member selected from the group of cooperating additives consisting of:
   a. 0.005 gram per liter to 0.2 gram per liter of primary brightener
   b. 1.0 gram per liter to 30 grams per liter of secondary brightener
   c. 0.5 gram per liter to 10 grams per liter of secondary auxiliary brightener
   d. 0.05 gram per liter to 1 gram per liter of anti-pitting agent;
2. 0.5 gram per liter to 5 grams per liter of an organic hydroxy-sulfonate compound of the formula:



wherein M is a cation having a valence of 1–2; *k* is an integer 1–2 corresponding to the valence of M; and R is hydrogen or a monovalent aliphatic group of 1–16 carbon atoms;

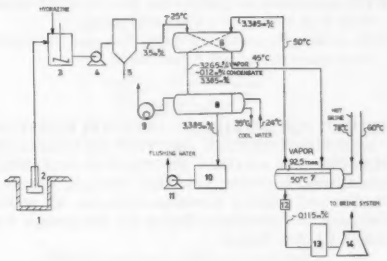
3. 10 grams per liter to 60 grams per liter of an hydroxy-carboxylate complexing compound or a polyol complexing compound selected from the group consisting of mannitol, sorbitol and dulcitol; and
4. 0.1 gram per liter to 5 grams per liter of an iodide of a bath compatible cation or a compound providing an iodide anion.

11. A process for the preparation of a cobalt-iron electrodeposit which comprises passing current from an anode to a cathode through an aqueous acidic plating solution containing 200 grams per liter to 500 grams per liter of cobalt sulfate, 45 grams per liter to 80 grams per liter of cobalt chloride, 15 grams per liter to 60 grams per liter of boric acid, 0.5 gram per liter to 5 grams per liter of erythorbic acid, 0.5 gram per liter to 10 grams per liter of sodium formaldehyde bisulfite, 0.1 gram per liter to 5 grams per liter of potassium iodide, 1.0 gram per liter to 30 grams per liter of sodium saccharinate, 0.5 gram per liter to 10 grams per liter of sodium allyl sulfonate, 5 grams per liter to 60 grams per liter of ferrous sulfate, and 0.005 gram per liter to 0.2 gram per liter of diethoxylated butynediol.

3,922,210
PROCESS OF AVOIDING MERCURY EMISSION FROM MERCURY-USING PLANTS

Heinz Isfort, and Hans-Peter Ilgner, both of Dortmund, Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Continuation-in-part of Ser. No. 176,866, Sept. 1, 1971, abandoned. This application Oct. 3, 1973, Ser. No. 403,113
Int. Cl.² C25B *1/36*
U.S. Cl. 204—99 **1 Claim**



1. A process for containing mercury emission within mercury-using plants by partially purifying the mercury-contaminated water and using said water as the flushing water within the mercury-using plant so that no mercury-containing water is discharged outside of the plant, said process comprising the steps of:

I. collecting mercury bearing waste water which includes Hg^o, Hg^{++}, Hg^+, $HgCl_3^-$, $HgCl_4^-$, $HgCl_4^{--}$, Fe^{+++}, NaCl and organic and silicon compounds from mercury cathode electrolysis cells in a waste water pit;
II. pumping the mercury-bearing waste water to a mixing tank;
III. adding hydrazine to the mixing tank which reduces some of the metallic ions to the metal form, thereby producing reduced mercury-bearing mercury waste water that mostly contains finely-divided metals, Fe^{+++}, NaCl, and organic and silicon compounds;
IV. pumping the reduced mercury-bearing waste water to a pre-coat filter;
V. separating in the pre-coat filter a sludge of metallic mercury and other solid material and having a filtrate which still contains some mercury, Fe^{+++}, NaCl, and other compounds;
VI. conveying the filtrate to a receiver;
VII. sending the filtrate by a centrifugal pump through a pre-heater, which is heated indirectly by the water vapor circulating in the preheater from Step XI, to achieve a heated filtrate;
VIII. conveying the heated filtrate to an evaporator which is equipped with means for blow-down operations to eliminate the excessive NaCl;
IX. heating the evaporator with hot brine from the brine process of the plant in order to heat further the heated filtrate;
X. applying a vacuum sufficient to vaporize the heated filtrate to a water vapor;
XI. withdrawing the water vapor through the pre-heater in Step VII wherein the water vapor heats the heated filtrate and a small amount of the water vapor condenses to form a condensate;
XII. conveying the water vapor and condensate from Step XI to a condenser which is connected to a vacuum pump;
XIII. employing cooling water in the condenser to condense the water vapor to a liquid water;
XIV. conveying the liquid water to a receiver from where it can be withdrawn for use as flushing water in the mercury-using plant;

XV. arranging to regularly blow-down the heated filtrate in the evaporation of Step IX by removing a portion of the total volume of heated filtrate per hour through a trap, said withdrawn filtrate termed a brine because the mechanism for timed withdrawal is related to the salt concentration;

XVI. conveying the brine to a receiver;

XVII. conveying the brine from the receiver to a separator wherein Hg, $Fe(OH)_3$, sand, and other solid particles termed sludge are retained and the brine freed of these ingredients is added to the brine system;

XVIII. combining the sludge from Step XVII and the sludge from Step V to form a combined sludge;

XIX. sending the combined sludge to a mer .ry distillation oven wherein mercury is recovered.

3,922,211

METHOD FOR IMPROVING ABRASION RESISTANCE AND FOR REDUCING FRICTION OF SURFACES RUBBING ONE AGAINST ANOTHER IN MACHINERY

Adam Gierek, Katowice; Franciszek Binczyk, Siemianowice Slaskie, and Andrzej Kowalski, Katowice, all of Poland, assignors to Politechnika Slaska im. Wincentego Pstrowskiego, Gliwice, Poland

Filed Oct. 16, 1974, Ser. No. 515,683
Int. Cl.² C23B *1/00*
U.S. Cl. 204—140 **9 Claims**

1. A process for improving abrasion resistance and reducing friction of a ferrous metal surface against another such surface comprising submerging said surface in a bath of molten salts containing a sulfur compound and subjecting said surface to an electrolytic treatment with electric current of periodically reversing polarity said surface comprising one of two electrodes and being positively polarized for a period from two to 20 times as long as it is negatively polarized.

3,922,212

CATHODIC ELECTRODEPOSITION OF SURFACE COATINGS AND COMPOSITIONS THEREFOR

Allan E. Gilchrist, Westlake, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Continuation of Ser. No. 662,866, Aug. 24, 1967, abandoned. This application Feb. 24, 1971, Ser. No. 118,571
Int. Cl.² C25D *13/06, 13/10*
U.S. Cl. 204—181 **1 Claim**

1. In a process for electrocoating a cathode in an electrical circuit comprising a bath of aqueous medium in electrical contact with said cathode and with an anode, wherein said bath comprises a dispersion of a polymeric tertiary aminoalkanol ester of a polymeric carboxylic acid in intimate admixture with pigment, said dispersion being stabilized by ionization of said ester with an acid at least as strong as acetic acid, said process comprising passing a direct current through said circuit at a potential sufficiently high to electrodeposit said ester and said pigment from said bath as a coating on said cathode, the improvement which comprises supplementing the solids content of said bath, to prevent substantial depletion thereof by electrodeposition therefrom upon said cathode, with a supplementing composition comprising an intimate mixture of:

a. pigment having an average particle size not substantially in excess of 2 microns for pigments having a density of 3.5 or more and an average particle size not substantially in excess of 5 microns for pigment having a density of less than 3.5, said pigment having a particle size distribution wherein not more than about 5 percent by weight of said pigment has a particle size above about 10 microns and said pigment remaining particulate when the resulting electrodeposit is cured, and

b. polymeric tertiary aminoalkanol ester, the concentration of said ester in said supplementing composition being substantially above that in said bath and the weight ratio of said ester to said pigment in said supplementing composition being substantially the same as the weight ratio of said ester to said pigment in the coating being deposited and at least about 1.5:1 and from about 70 to about 80 percent of the weight ratio of said ester to said pigment in said bath when the electrodeposition potential is in the range of about 25 to about 250 volts,

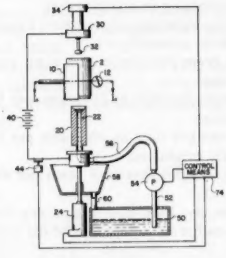
the concentration of ionizing acid in said supplementing composition being substantially below that in said bath, whereby the composition of said bath is maintained substantially constant by simultaneously supplementing said ester and said pigment in substantially the ratio in which they are removed from said bath by electrodeposition while utilizing the ionizing acid accumulated in said bath to ionize the supplementing ester added to said bath in said supplementing composition.

3,922,213

METHOD AND APPARATUS FOR UNIFORMLY ELECTROCOATING THE INTERIOR OF A SHAPED METAL CONTAINER

David A. Smith, Pittsburgh, Pa.; Steven C. Smith, Arlington, Mass., and John J. Davidson, New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 23, 1974, Ser. No. 517,326
Int. Cl.² C25D *13/14*
U.S. Cl. 204—181 **12 Claims**



1. A process for uniformly electrocoating the interior of a shaped metal container which comprises:

a. inverting the container;

b. inserting into the inverted container an electrically conducting nozzle;

c. flowing coating material through said nozzle into the interior of said container at a flow rate sufficient to fill the container; and

d. simultaneously imposing an electrical potential between said container and said nozzle to cause said coating to electrocoat the interior of said container interior.

6. An apparatus for uniformly electrocoating the interior of a shaped metal container which comprises:

a. means for retaining said container in an inverted position;

b. means for coating the interior of said container, said means including an electrically conducting nozzle insertable into said container, said nozzle having a passageway therein adapted to flow coating material into said container;

c. means for simultaneously imposing an electrical potential between said container and said nozzle to cause said coating material to electrocoat said container interior; and

d. means for discontinuing said flow of coating and said imposition of an electrical potential between said nozzle and said container prior to buildup of a coating thickness sufficient to limit further electrocoating.

3,922,214
DEVICE FOR MANUFACTURING THIN LAYERS OF MINERAL SUBSTANCES

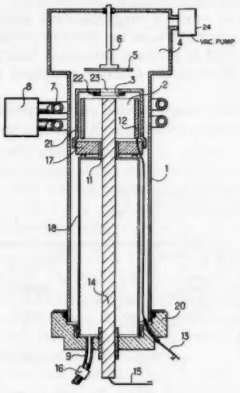
Jean L. Van Cakenberghe, Beersel, Belgium, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 27, 1974, Ser. No. 455,097

Claims priority, application Belgium, Mar. 27, 1973, 129306

Int. Cl.² C23C *15/00*

U.S. Cl. 204—298 **8 Claims**



1. In a device for plasma deposition of a thin conductive layer onto the surface of a substrate, said device comprising a container, means forming a cavity within said container, and having a cavity opening therein, electromagnetic energizing means for setting up a plasma within said cavity for passage through said cavity opening, means for supporting said substrate within said container facing said cavity opening and spaced therefrom, means for supplying a fluid under pressure to said cavity, vacuum pump means connected to said container for maintaining a vacuum pressure within said container, the improvement comprising within said cavity, inner and outer concentrically spaced cylindrical electrodes and at least the surface of the inner cylindrical electrode carrying the conductive substance to be deposited on the surface of the substrate by plasma deposition, and means for providing a potential difference across said electrodes to effect arcing therebetween.

Oil Shale Cover.

3,922,215
PROCESS FOR PRODUCTION OF HYDROCARBON LIQUIDS AND GASES FROM OIL SHALE

Henry R. Linden, Chicago; Paul B. Tarman, Elmhurst, and Harlan L. Feldkirchner, Elk Grove Village, all of Ill., assignors to American Gas Association, Arlington, Va.

Filed June 1, 1973, Ser. No. 365,973

Int. Cl.² C10B *53/06*

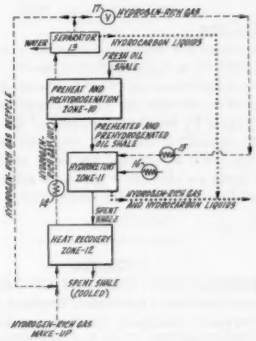
U.S. Cl. 208—11 **18 Claims**

1. A process for the production of aliphatic and alicyclic hydrocarbon liquids from oil shale wherein above about 77 percent of the organic carbon in said oil shale is converted to said liquids and gases comprising the steps:

introducing fresh oil shale into a preheat and prehydrogenation zone;

gradually preheating, at a rate of less than about 100°F. per minute, oil shale in the preheat and prehydrogenation zone to a temperature of about 700° to about 950°F. in the presence of hydrogen-rich gas with less than about 20 weight percent of the organic component of oil shale converted to liquid and gas in said preheat and prehydrogenation zone, said hydrogen-rich gas and shale passing countercurrently in said zone;

destructively distilling the preheated and prehydrogenated oil shale in a hydroretort zone at a temperature of about 850° to about 1250°F. in the presence of at least a stoichiometric amount of hydrogen-rich gas to form aliphatic



and alicyclic hydrocarbon liquids and low molecular weight paraffinic hydrocarbon gases from the preheated and prehydrogenated organic portion of said oil shale; and

said hydrogen-rich gas being supplied to said preheat and prehydrogenation zone in larger volumes than the hydrogen-rich gas supplied to said hydroretort zone.

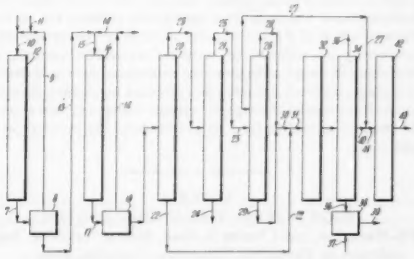
3,922,216
PRODUCTION OF LIGHT ENDS

Raymond F. Wilson, Fishkill; John H. Estes, Wappingers Falls, and Stanley Kravitz, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 29, 1974, Ser. No. 474,282

Int. Cl.² C10G *37/06*, *13/02*, *9/36*

U.S. Cl. 208—73 **19 Claims**



1. The method which comprises

thermally steam cracking, in the presence of steam at thermal steam cracking conditions, a hydrocarbon thermal steam cracking charge stream including (i) a hydrocarbon component containing at least about 9 carbon atoms and (ii) deisobutanized C_3 to C_5 paraffin stream thereby forming a product stream containing (i) an ethylene fraction and (ii) a C_3 to C_4 olefin fraction; and

recovering said product stream.

3,922,217
REMOVAL OF POLAR COMPOUNDS FROM HYDROCARBON MIXTURES CONTAINING THE SAME

Georges Cohen, Rueil-Malmaison; Francis Gracco, Montesson, and Paul Mikitenko, Chatou, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 14, 1974, Ser. No. 469,783

Claims priority, application France, May 17, 1973, 73.18035

Int. Cl.[2] C07C *9/00, 7/00*

U.S. Cl. 208—299 **26 Claims**

1. In a process for removing a polar compound from a solution thereof in a liquid hydrocarbon by contacting said solution with a macroporous or gel-type cation exchange resin the improvement wherein said cation exchange resin contains at least 1 percent by weight of water and the hydrocarbon is subsequently separated from the resin on which at least a portion of the polar compound has been retained, said polar compound being an alcohol, a glycol, a sulfoxide, an amide, a lactam, an aldehyde, a sulfone, an oxazine, a nitrile, a ketone or an ester.

3,922,218
HYDROCARBON SEPARATION PROCESS

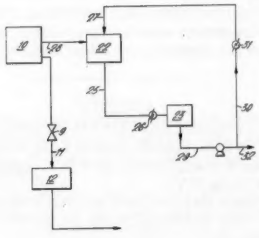
Gordon James Wanless, Lightwater, England, assignor to The British Petroleum Company Limited, London, England

Filed July 22, 1974, Ser. No. 490,483

Claims priority, application United Kingdom, July 26, 1973, 35614/73

Int. Cl.[2] C10G *25/04*

U.S. Cl. 208—310 **13 Claims**



1. A process for the separation of n-paraffins boiling in the gasoline range from a mixture thereof with non-straight chain hydrocarbons which process comprises passing the mixture through a bed of a 5A molecular sieve in an adsorption stage, recovering an effluent of reduced n-paraffin content and desorbing the n-paraffin from the molecular sieve in a desorption stage, wherein desorption is effected by passing desorbed n-paraffin product through an ejector using recycled n-paraffin product as motive fluid so as to reduce the pressure in the bed.

3,922,219
HIGH INTENSITY MAGNETIC SORTER

Jeh-Mann Lee, and Charles E. Roos, both of Nashville, Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Filed Aug. 31, 1973, Ser. No. 393,662

Int. Cl.[2] B03C *1/22*

U.S. Cl. 209—223 A **2 Claims**

1. A high intensity magnetic sorting apparatus for the separation of feebly magnetic materials from non-magnetic materials comprising:

a. a sorter wheel having a circumferential rim portion of uniform width,

b. a frame supporting said wheel for rotary movement about a horizontal axis and said rim portion for movement in an operative feed path for said magnetic materials,

c. drive means rotating said wheel,

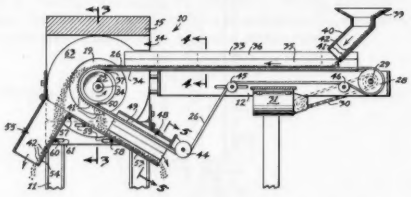
d. an electromagnet stationarily mounted on said frame, and having pole tips spaced on opposite sides of said wheel,

e. said pole tips having inner faces spaced apart on opposite sides of said rim portion a distance slightly greater than the width of said rim portion,

f. each of said pole faces comprising at least a circular segment coaxial of said wheel, having a diameter substantially equal to the diameter of said wheel, and extending circumferentially parallel to, and at least the length of, said operative feed path,

g. said pole tips being shaped to create a magnetic field, when said electromagnet is energized, across said rim portion to produce magnetic field gradients increasing radially inward toward the exterior periphery of said rim portion, and to produce maximum field gradients immediately adjacent the exterior periphery of said rim portion,

h. endless belt means carried circumferentially around said sorter wheel coinciding with said operative feed path for



feeding a mixture of feebly magnetic particles and non-magnetic particles in a path toward said wheel and substantially tangent to said rim portion, so that said particles are carried around said rim portion within said magnetic field and said feebly magnetic particles are magnetically attracted toward the exterior periphery of said rim portion by the magnetic force produced by said increasing gradients, so that said feebly magnetic particles move along said operative feed path around said wheel rim portion,

i. means for energizing said electromagnet,

j. means for receiving the non-magnetic material dropping by gravity from said rotary wheel, and

k. means for removing the feebly magnetic particles from said wheel at the end of said operative feed path comprising a portion of said belt means and a chute having a top wall projecting tangentially from the bottom portion of said wheel at the end of said operative feed path, said belt means being guided away from said wheel through said chute and beneath said top wall.

3,922,220
PERMEABLE MEMBRANE SEPARATION DEVICE AND METHOD

Stanley Middleman, Amherst, and Richard D. Devellian, Rockport, both of Mass., assignors to Kenics Corporation, North Andover, Mass.

Filed Nov. 2, 1973, Ser. No. 412,316

Int. Cl.[2] B01D *31/00, 13/00*

U.S. Cl. 210—23 **9 Claims**

1. A semipermeable membrane separation system comprising:

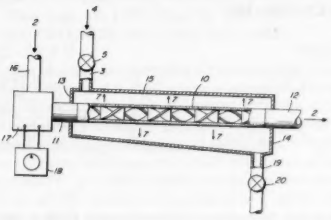
a. a conduit having a wall comprising a semipermeable membrane;

b. means for passing a first fluid through said conduit;

c. means for containing a second fluid outside of said conduit;

d. said conduit containing a plurality of curved sheet-like elements extending longitudinally within said conduit, each of said elements having a width substantially equal

to the inner diameter of said conduit, dividing said conduit into two separated flow paths, and having a curvature to impart a transverse rotational component of flow to said first fluid, said elements being arranged in alternating



right- and left-handed curvature groups wherein said transverse rotational component is alternately reversed, the leading and trailing edges of adjacent elements of succesive groups being disposed at a substantial angle with respect to each other.

3,922,221

PROCESS FOR CONDITIONING SEWAGE SLUDGES

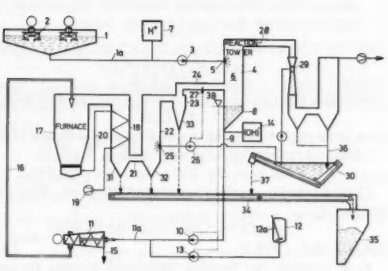
Norbert Rösler; Willi Georg Rudat, both of Essen-Uberruhr, and Erhard Albrecht, Essen, all of Germany, assignors to Rheinstahl Aktiengesellschaft, Germany

Continuation of Ser. No. 214,741, Jan. 3, 1972, abandoned. This application Jan. 18, 1974, Ser. No. 434,605

Claims priority, application Germany, Jan. 28, 1971, 2103970

Int. Cl.² C02C *3/00*

U.S. Cl. 210—50 **11 Claims**



1. In a process for pretreating sewage sludges prior to flocculation treatment, particularly sewage sludges coming from clarification plants, the improvement which comprises acidifying in a first pretreatment step said sludge to a pH below 4 and then spraying and disintegrating the sludge in a hot gas atmosphere saturated with moist water vapor, and rapidly heating the disintegrated sludge to a temperature in the range of from 41° to 100°C in a reaction time of about 1 to 10 seconds and forming the so-heated sludge into droplets in said hot gas atmosphere; accumulating and collecting the so-heated sludge droplets in a sludge bath, wherein the pH value of the sludge accumulated in said bath is adjusted in a second pretreatment step by addition of basic additives to said sludge (into) to at least a neutral range of about 6.5 – 7.0 pH; and subsequently removing the pretreated sludge from said bath and coagulating the so-pretreated sludge by addition thereto of a flocculant, and subsequently mechanically dehydrating the pretreated and coagulated sludge.

3,922,222

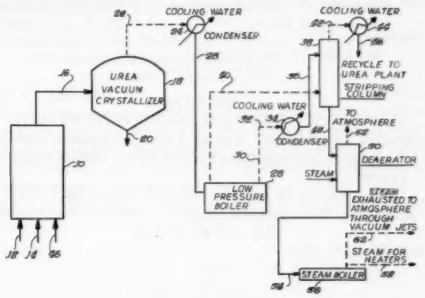
METHOD FOR TREATMENT OF UREA CRYSTALLIZER CONDENSATE

William H. Van Moorsel, Allegheny, N.Y., assignor to CF Industries, Inc., Chicago, Ill.

Filed Feb. 20, 1973, Ser. No. 334,065

Int. Cl.² C02B *1/02*

U.S. Cl. 210—71 **7 Claims**



2. A process, as defined in claim **1**, which includes recycling the ammonia and carbon dioxide to the urea plant.

3,922,223

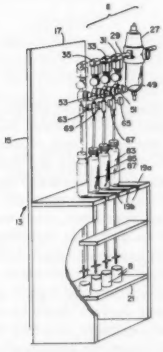
MULTIPLE CHROMATOGRAPHIC COLUMN SYSTEM

Gary L. Burkhartsmeier, Oakland, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1974, Ser. No. 454,655

Int. Cl.² B01D *15/08*

U.S. Cl. 210—198 C **1 Claim**



1. A chromatographic column system for forcing a mobile phase material through a stationary phase material comprising:

a. an air source;

b. said air source connected to the input of a primary regulator;

c. the output of said regulator connected to the input of a manifold;

d. the output of said manifold connected to the input of at least one on/off needle valve;

e. the output of said at least one on/off needle valve connected to at least one secondary regulator;

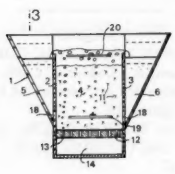
f. the output of said at least one secondary regulator connected both to at least one needle bleed valve and to at least one pressure column;

g. the output of said at least one pressure column connected to at least one filter;
h. the pressure in said at least one pressure column is maintained on or about a constant value; and
i. said at least one on/off needle valve, said at least one secondary regulator, said at least one needle bleed valve, said at least one pressure column, and said at least one filter respectively comprise a plurality of on/off needle valves, a plurality of secondary regulators, a plurality of needle bleed valves, a plurality of pressure columns and a plurality of filters.

3,922,224
APPARATUS FOR TREATING WASTE WATERS

Raymond Lewandowski, Rennes, France, assignor to Etudes et Procedes d'Assainissement Purator EPAP, Societe Anonyme, France

Continuation of Ser. No. 346,410, March 30, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,404
Int. Cl.² B03C *1/30*
U.S. Cl. 210—223 **8 Claims**

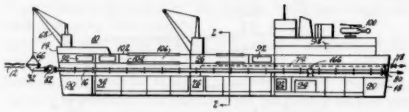


1. A water treatment bed of particles for removing waste metals in ionic form from industrial effluents, said waste metals being taken from the class of metals including copper, cadmium, palladium, lead, and tin, said bed comprising from top to bottom a mixture of sand and metallic particles resting upon a perforated bed plate mounted above a continuously pressurized gas compartment, said metallic particles being taken from the class of metals including iron, aluminum, and zinc, said particles having a higher electromotive voltage than said waste metals whereby said waste metals tend to attach themselves to the particles of higher electromotive voltages, means for applying current from an electric DC source to form said bed into a cathode, whereby electric current flowing through the bed causes an electro-chemical action for preventing the surfaces of said particles from oxidizing, means for continuously blowing said gas from said gas compartment and into said bed via said perforations, whereby said bed is adapted to enable a continuous passage of a gas from said compartment, through the perforations in said bed plate, up into and through said mixtures, means for adjusting the flow of said gas to continuously bubble said gas through said bed plate and up into said mixture of sand and particles with a force which continuously agitates the sand and particles sufficiently to produce an abrasive action between the sand and metal particles which abrasion detaches the waste metals from said particles, and effluent conveying means comprising an entrance and exit for continuously directing an effluent containing said waste metal through said bed along a path through the gas which bubbles up through said mixture, whereby said effluent is treated while it is in and passes through said bed.

3,922,225
SEA-WATER OIL SPILL CLEANING SYSTEM

Patrick J. Strain, 27 Tanglewood Drive, Lynwood, Ottawa, Ontario, Canada

Filed Feb. 19, 1974, Ser. No. 443,742
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 **1 Claim**



1. In the separation of oil and water from a spill of oil on a water surface, the apparatus which includes;
a ship having holding tanks therein;
a wide shallow steam-jacketed lagged and peripherally fenced funnel-shaped intake, adjustably outwardly suspended from one end of said ship, said intake having a surrounding wall converging from a large open mouth to a discharge aperture of relatively restricted area therebelow for admitting and separating said oil from said water externally of said ship;
a flexible conduit connecting said discharge aperature to said ship;
a set of spaced but interconnected pontoons arranged in ring formation about said intake to dampen wave action in said water surface adjacent said intake;
a secondary separation means within said ship comprising at least one conduit located longitudinally fore and aft of said ship and connected to said flexible conduit, and having a plurality of baffles thereacross to direct the oil into said holding tanks within said ship;
and mobile anchoring means connected to said intake means for maintaining said intake in position relative to an anchored ship thereby removing any current or wave induced strain from said flexible conduit.

3,922,226
ANODES FOR MERCURY-CATHODE ELECTROLYTIC CELLS

John Hubert Entwisle, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 30, 1974, Ser. No. 465,558
Claims priority, application United Kingdom, May 16, 1973, 23334/73
Int. Cl.² C23B *11/00*; B32B *3/02*
U.S. Cl. 204—290 F **16 Claims**

1. A process for forming improved anodes for mercury-cathode electrolytic cells, by forming on an anode an anodically-conducting oxidic coating having a porous outer layer of a chlorine resistant polymer bonded thereto, said polymer being polyvinylidene fluoride or low molecular weight polytetrafluoroethylene, the process comprising coating the anode with the oxidic coating, wherein the oxidic coating comprises a platinum group metal oxide; applying to said oxidic coating the polymer in admixture with a removable solid particulate material, wherein said solid particulate material is an alkali metal chloride, starch, cellulose, a water insoluble base or carbonate thereof; bonding the polymer to the oxidic coating by successive stages of drying by heating in air at about 160°C, heating to melt the polymer at temperatures of up to 280°C, and cooling; and subsequently removing the solid particulate material from the coating by dissolving the particulate material by dissolving in water or dilute acid, whereby the short-circuit current between the anode and the mercury cathode at any given impressed voltage is reduced without preventing passage of the electrolyzing current under normal operating conditions.

3,922,227

ANTIOXIDANT HETEROCYCLIC NITROGENOUS AROMATIC CONTAINING OIL COMPOSITIONS

Walter W. Hellmuth, Hopewell Junction; Walter D. Foucher, Jr., Fishkill, and William R. Siegart, Poughkeepsie, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,356
Int. Cl.² C10M *1/48, 3/42, 1/32, 3/26*
U.S. Cl. 252—32.7 E 15 Claims

1. A lubricant oil composition resistant to oxidative thickening at elevated temperatures comprising a mineral lubricating oil containing from 0.01 to 50% by weight of a heterocyclic nitrogenous-containing mixture derived from uintaite and distilled therefrom by a procedure that comprises subjecting uintaite to a cracking temperature within the range of about 885° to about 910°F. to yield a fraction boiling in the range of about 400° to 650°F. which is sequentially treated with a strong mineral acid to form an acid phase and an acid insoluble organic phase; hydrolyzing said acid phase to provide an acid insoluble organic fraction and an aqueous fraction; neutralizing the latter aqueous fraction with a base to yield further organic- and water-containing phases; and recovering said organic phase comprising said heterocyclic nitrogenous-containing mixture therefrom.

3,922,228

AZEOTROPIC COMPOSITION CONSISTING OF DIFLUOROMETHYL TRIFLUOROMETHYLETHER AND DIMETHYL ETHER

William M. Hutchinson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 22, 1973, Ser. No. 344,025
Int. Cl.² C09K *5/00*
U.S. Cl. 252—67 6 Claims

1. a substantially constant boiling admixture of a major proportion of difluoromethyl trifluoromethyl ether and a minor amount of dimethyl ether wherein said admixture is characterized as an azeotrope.

3,922,229

POWDERLESS ETCHING BATH FOR MAGNESIUM PRINTING PLATES

Marvin H. Fishaber, Saginaw, and Philip C. White, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 12, 1973, Ser. No. 415,052
Int. Cl.² C09K *13/06*
U.S. Cl. 252—79.4 37 Claims

1. A bath composition for etching photoengraving plates of magnesium or alloys thereof which comprises water and, per liter of bath:

a. from about 70 grams to about 360 grams of 42° Baume nitric acid;
b. from about 0.25 gram to about 5 grams of a sulfated fatty acid ester having from 10 to 24 carbon atoms in the acid moiety and from 1 to 12 carbon atoms in the alcohol moiety.
c. from about 0.25 gram to about 6 grams of a first saturated or olefinically unsaturated carboxylic acid which comprises a hydroxy-unsubstituted monocarboxylic acid of from 2 to 6 carbon atoms, or a polycarboxylic or hydroxy-substituted monocarboxylic acid of from 2 to 8 carbon atoms;
d. from about 2 grams to about 25 grams of a polyhydric alcohol of from 2 to 10 carbon atoms or an ether derivative thereof;
e. from about 2 grams to about 15 grams of a second saturated or olefinically unsaturated carboxylic acid which comprises at least one hydroxy-unsubstituted monocarboxylic acid having from 8 to 24 carbon atoms; and
f. from about 0.25 gram to about 4 grams of an alkylarylsulfonate selected from the group consisting of the alkylbenzenesulfonates wherein the alkyl portion contains from 8 to 18 carbon atoms and the alkylnaphthalenesulfonates wherein the alkyl portion contains from 3 to 18 carbon atoms.

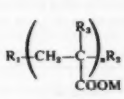
3,922,230

OLIGOMERIC POLYACRYLATES AS BUILDERS IN DETERGENT COMPOSITIONS

Vincent Lamberti, Upper Saddle River, and Chester R. Willis, Mapleshade, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 169,101, Aug. 4, 1971, abandoned. This application Apr. 15, 1974, Ser. No. 461,060
Int. Cl.² C11D *3/37*
U.S. Cl. 252—89 9 Claims

1. A detergent composition comprising a water soluble detergent compound selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic detergent compounds and mixtures thereof; and a builder salt comprising an oligomeric polyacrylate having a molecular weight of greater than about 500 and less than about 10,000 represented by the formula



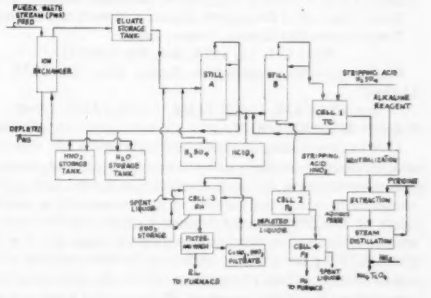
wherein n is a whole number integer, R_1 and R_2 are moieties which do not impair biodegradability of the molecule and are selected from the group consisting of biodegradable sulfur containing moieties and biodegradable hydroxy containing moieties, R_3 is selected from the group consisting of hydrogen and alkyl groups having one to six carbon atoms and M is selected from the group consisting of alkali metal, ammonium and substituted ammonium cations; the weight ratio of the builder salt to detergent compounds ranging from 1:20 to about 20:1.

3,922,231

PROCESS FOR THE RECOVERY OF FISSION PRODUCTS FROM WASTE SOLUTIONS UTILIZING CONTROLLED CATHODIC POTENTIAL ELECTROLYSIS

William W. Carlin, Portland, and William B. Darlington, Corpus Christi, both of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1972, Ser. No. 309,015
Int. Cl. C02c *5/14*
U.S. Cl. 252—301.1 W 18 Claims



1. A process for separating palladium, rhodium and technetium values from an alkaline aqueous solution containing said metal values in the form of anions, as well as other fission product metal values, said aqueous solution resulting from processing irradiated nuclear fuel, which comprises, in combination, the steps of:

a. contacting the alkaline aqueous solution with an anion exchange resin to adsorb palladium, rhodium and technetium values thereon;
b. eluting adsorbed palladium, rhodium and technetium values from the anion exchange resin whereby to obtain an eluate containing the eluted metal values;
c. separating technetium as its volatile oxide from an aqueous solution containing the eluted metal values while retaining eluted palladium and rhodium values in said solution and collecting the thus separated technetium oxide;
d. subjecting an acidic solution of the collected technetium to an electrolyzing current under controlled cathodic potential conditions sufficient to deposit technetium on the cathode;
e. subjecting a substantially technetium free acidic solution of the eluted palladium and rhodium values to an electrolyzing current under controlled cathodic potential conditions sufficient to deposit palladium on the cathode but insufficient to deposit thereon any substantial quantity of rhodium; and
f. subjecting the palladium depleted solution of step (e) to an electrolyzing current under controlled cathodic potential conditions sufficient to deposit rhodium on the cathode.

3,922,232

FLUORESCENT COLORANTS

Alan K. Schein, Napa County, Calif., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 23, 1973, Ser. No. 418,795
Int. Cl.² C08J *3/20*; C09K *3/00*
U.S. Cl. 252—301.2 R **10 Claims**

1. A fluorescent colorant comprising particles of a resinous precondensate colored with a fluorescent dyestuff, said precondensate being a nontacky solid soluble in acetone and dimethylformamide at 25°C., having a softening point of at least about 70°C. and being derived from about 0.5 to about 2.0 moles of at least one aliphatic, aromatic or alicyclic polyfunctional acid component selected from the group consisting of carboxylic acids, esters and anhydrides and one mole of at least one polyhydroxy compound selected from the group consisting of aliphatic polyhydroxy compounds and tris-(hydroxyalkyl) isocyanurates, at least one of said polyfunctional acid component or polyhydroxy compound having a functionality greater than 2.

3,922,233

WHITE EMITTING PHOSPHORS

Tatsuki Torii; Yoshihisa Nagashima; Haruhiko Kitamura, and Etsuo Mori, all of Kanagawa, Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1974, Ser. No. 514,711
Claims priority, application Japan, Oct. 13, 1973, 48-114344
Int. Cl.² C09K *11/10*, *11/14*, *11/18*, *11/30*, *11/46*
U.S. Cl. 252—301.6 S **8 Claims**

1. A white-emitting phosphor for black and white television which consists essentially of a mixture of a yellowish green-to-yellow emitting, gold- and aluminum-activated zinc sulfide phosphor in which the amount of activating gold is within a range of 5×10^{-4} g to 10^{-2} g per g of zinc sulfide and the amount of activating aluminum is within a range of 2.5×10^{-4} g to 5×10^{-3} g per g of zinc sulfide and a blue-emitting silver-activated zinc sulfide phosphor in which the amount of activating silver is within a range of 10^{-5} g to 10^{-3} g per g of zinc sulfide, wherein the weight ratio of the silver-activated zinc sulfide to the gold- and aluminum- activated zinc sulfide is within a range of 0.70 to 1.30.

4. A white-emitting phosphor for black and white television which consists essentially of a mixture of a yellowish green-to-yellow emitting, gold- and aluminum-activated zinc sulfide phosphor in which the amount of activating gold is within a range of 5×10^{-4} g to 10^{-2} g per g of zinc sulfide and the amount of activating aluminum is within a range of 2.5×10^{-4} to 5×10^{-3} g per g of zinc sulfide, a blue-emitting silver-activated zinc sulfide phosphor in which the amount of activating silver is within a range of 10^{-5} g to 10^{-3} g per g of zinc sulfide, and at least one red-emitting phosphor selected from europium-activated yttrium oxysulfide, europium-activated yttrium oxide and europium-activated yttrium vanadate, in each of which the amount of activating europium is within a range of 1.0×10^{-2} g to 1.5×10^{-1} g per g of yttrium oxysulfide, yttrium oxide or yttrium vanadate, wherein the weight ratio of said red-emitting phosphor to said gold- and aluminum-activated zinc sulfide phosphor is not greater than 3/7 and the weight ratio of the silver-activated zinc sulfide phosphor to the sum of the gold- and aluminum-activated zinc sulfide phosphor and the red-emitting phosphor is within a range of 0.70 to 1.30.

3,922,234

CATALYST FOR PURIFYING EXHAUST GAS BY REMOVING NITROGEN OXIDES AND A PROCESS FOR THE MANUFACTURE THEREOF

Tsuchio Bunda, Okazaki; Itaru Niimi, Nagoya; Yasuhisa Kaneko, Toyota; Katsumi Kondo, Toyota; Akiyoshi Morita, Toyota; Mototsugu Koyama, Toyota; Mitsuyoshi Sato, Toyota, and Shoji Miyazaki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 2, 1973, Ser. No. 347,042
Claims priority, application Japan, Apr. 1, 1972, 47-32864
Int. Cl.² B01J *29/14*, *21/04*, *23/74*
U.S. Cl. 252—455 R **13 Claims**

1. A catalyst for purifying automotive exhaust gas by removing nitrogen oxides therefrom, which is obtained by forming a copper-diffused layer on the surface of a metallic material molded into a desirable shape which is selected from a group of iron, iron alloys, nickel, nickel alloys by burying the molded metallic material in a diffusion-penetration treating agent composed of copper powder, inert powder and halogen compound; and heating this material in a protective atmosphere, whereby a copper-diffused layer is formed on the surface of said metallic material.

3,922,235

STABILIZED RUTHENIUM CATALYSTS FOR SELECTIVE REDUCTION OF OXIDES OF NITROGEN

John P. DeLuca, New Providence; Lawrence L. Murrell, Elizabeth; Richard P. Rhodes, Westfield, and Samuel J. Tauster, Englishtown, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed July 31, 1974, Ser. No. 493,329
Int. Cl.² B01J *21/06*
U.S. Cl. 252—472 **5 Claims**

1. A stabilized supported ruthenium catalyst, said catalyst comprising ruthenium metal in combination with an oxide support, said support being one selected from the group consisting of zirconium titanate, and zirconium titanate mixed with titania, the ruthenium being present in an amount which does not exceed 0.003 grams of ruthenium per gram of oxide support.

3,922,236

ELECTRICAL CONTACT MATERIALS

Peter Douglas; David John Pedder; Peter John Swallow, all of Northampton, England, and Terrence Ardern Davies, St. James, N.Y., assignors to Square D Company, Park Ridge, Ill.

Filed July 30, 1973, Ser. No. 384,161
Claims priority, application United Kingdom, Aug. 1, 1972, 35826/72
Int. Cl.² B27F 1/00
U.S. Cl. 252—514 25 Claims

2. An electrical contact formed from a material which consists of a mixture of silver, 5 to 50 weight percent of copper and 2 to 20 weight percent of lanthanum, strontium chromite of formula La_{1-x} Sr_xCrO_3, where the values of x lie between 0 and 1.0, formed as a hard, chemically inert, nonmetallic phase of high electrical conductivity both within the bulk of, and at the surface of, the contact material.

11. A method of producing an electrical contact material including the steps of providing irregular silver powder having a powder particle size of not greater than approximately 350 mesh; providing irregular copper powder having a powder particle size of not greater than approximately 350 mesh; providing lanthanum strontium chromite powder of formula $La_{1-x}Sr_xCrO_3$, where the values lie between 0 and 1.0, and having a powder particle size of not greater than approximately 10 microns; mixing the powders together to provide a fine, evenly dispersed mixture containing 5 to 50 weight percent of copper, 2 to 20 weight percent of $La_{1-x}Sr_xCrO_3$ and the remainder silver; compacting the powder mixture into a desired shape; and sintering the compacted shape.

22. An electrical contact material produced by a method including the steps of providing irregular silver powder having a powder particle size of not greater than approximately 350 British Standard mesh; providing irregular copper powder having a powder particle size of not greater than approximately 350 British Standard mesh; providing lanthanum strontium chromite powder of formula $La_{1-x}Sr_xCrO_3$, where the values of x lie between 0 and 1.0, and having a powder particle size of not greater than approximately 10 microns; mixing the powders together to provide a fine, evenly dispersed mixture containing 5 to 50 weight percent of copper, 2 to 20 weight percent of $La_{1-x}Sr_xCrO_3$ and the remainder silver; compacting the powder mixture into a desired shape; and sintering the compacted shape.

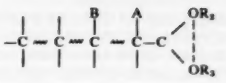
3,922,237

NOVEL PERFUME COMPOSITIONS AND PERFUMED ARTICLES CONTAINING DI-LOWER ALKYL AND LOWER ALKYLENE ACETALS OF 2-AND 3-PHENYL PENTENALS

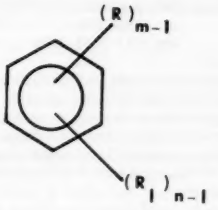
William Lewis Schreiber, Jackson; Manfred Vock, Locust; John B. Hall, Rumson, all of N.J.; Edward Joseph Shuster, New York, N.Y., and Alton Dewitt Quinn, Abrahamsville, Pa., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 276,922, Aug. 1, 1972, abandoned. This application Sept. 10, 1974, Ser. No. 504,738
Int. Cl.² A61K 7/49; C11C 9/00
U.S. Cl. 252—522 6 Claims

1. A process for altering the aroma properties of consumable material selected from the group consisting of perfume compositions and perfumed articles which comprises adding thereto a small but effective amount of at least one acetal having the structure:



wherein one of A or B is of the structure:



wherein R represents hydrogen or lower alkoxy containing from 1 to 5 carbon atoms, R_1 represents hydrogen or lower alkyl containing from 1 to 5 carbon atoms, R_2 and R_3 each represents the same or different lower alkyl containing from 1 up to 4 carbon atoms; or R_2 and R_3 taken together represents alkylene having from 2 up to 4 carbon atoms and m and n represent integers of 1 to 5 inclusive, their susm $(m+n)$ being from 2 to 7, and wherein one of the wavy lines represents a carbon to carbon double bond and the other two lines each represents a carbon to carbon single bond, the remaining valence of each carbon atom being satisfied by at least one member selected from hydrogen and lower alkyl of 1 to 5 carbon atoms.

6. A fragrance modifying composition containing at least one acetal according to claim 1 and an auxiliary perfume ingredient.

3,922,238

CARBODIIMIDE-ISOCYANURATE FOAMS CONTAINING URETHANE LINKAGES

Thirumurti L. Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 23, 1974, Ser. No. 472,587
Int. Cl.² C08G 18/06, 18/18, 18/30, 18/40
U.S. Cl. 260—2.5 BF 14 Claims

1. A cellular foam composition prepared by condensing an organic polyisocyanate in the presence of a blowing agent, from 0.01 to 0.5 equivalent per equivalent of isocyanate of a primary hydroxy-terminated polyoxyalkylene or polyester polyol having an average functionality of from two to eight and an average equivalent weight of from about 150 to 1500 and a catalytically sufficient amount of a catalyst system comprising (a) furfuryl alcohol, (b) a tertiary amine trimerization catalyst, and (c) a urethane catalyst.

3,922,239

CELLULOSE ESTERS OR ETHERS BLENDED WITH CYCLIC ESTER POLYMERS

Joseph Victor Koleske; Clyde Jesse Whitworth, Jr., both of Charleston, W. Va., and Robert Dean Lundberg, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

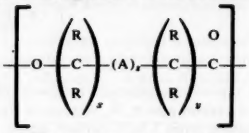
Division of Ser. No. 140,951, May 6, 1971, Pat. No. 3,781,381, which is a continuation-in-part of Ser. No. 812,314, April 1, 1969, abandoned. This application Oct. 11, 1973, Ser. No. 405,528

Int. Cl.² C08L *1/10*

U.S. Cl. 260—13 **12 Claims**

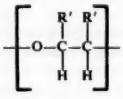
1. A thermoplastic composition consisting essentially of a blend of about 1 to about 95 weight percent of a cyclic ester polymer having a reduced viscosity measured at a concentration of 0.2 gram of polymer in 100 milliliters of benzene at 30°C. of about 0.1 to about 15 and containing at least a major molar amount of recurring units I of the formula:

(I)



wherein each R, individually, is selected from the class consisting of hydrogen, alkyl, halo, and alkoxy; A is the oxy group; x is an integer from 1 to 4; y is an integer from 1 to 4; z is an integer of zero or one; with the proviso that (a) the sum of $x + y + z$ is at least 4 and not greater than 7, and (b) the total number of R substituents which are substituents other than hydrogen does not exceed 3, and up to a minor molar amount of recurring units II of the formula:

(II)



wherein each R′ is selected from the class consisting of, individually, hydrogen, alkyl, cycloalkyl, aryl, and chloroalkyl, and, together with the ethylene moiety of the oxyethylene chain of Unit II, a saturated cycloaliphatic hydrocarbon ring having from 4 to 8 carbon atoms, and about 5 to about 99 weight percent of a cellulose ester from the group consisting of the cellulose acetates, cellulose butyrate, cellulose acetate butyrate, cellulose propionate, cellulose tridecanoate, carboxymethyl cellulose, ethyl cellulose, hydroxyethyl cellulose and acetylated hydroxyethyl cellulose.

3,922,240

PROCESS FOR THE PRODUCTION OF POURABLE, PULVERULENT RUBBER-FILLER MIXTURES

Gerhard Berg; Karl-Heinz Nordsiek, and Egge Barnstedt, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed May 17, 1974, Ser. No. 471,161

Claims priority, application Germany, May 19, 1973, 2325550

Int. Cl.² C08L *1/28*; C08K *5/01*; C08J *3/16, 3/20*

U.S. Cl. 260—17 R **17 Claims**

1. In a process for preparing discrete, finely divided, tack-free, pourable, powdery, filler-containing elastomer particles from an admixture of (a) an aqueous elastomer emulsion comprising (i) a solution of vulcanizable elastomer dissolved in a volatile, inert organic solvent, (ii) an elastomer emulsifying amount of a quaternary ammonium salt cationic surfactant and (iii) water; and (b) an aqueous suspension or dispersion of a solid, finely divided elastomer filler, which process comprises gradually introducing said admixture into an aqueous alkali silicate solution containing 0.5–20 moles of SiO_2 per mole of said quaternary ammonium salt while maintaining said silicate solution at pH of 7–14 and simultaneously evaporating said volatile organic solvent to form said filler-containing elastomer particles, the improvement which comprises:

admixing (i) and (iii) with (b) to form an unstable pseudo-emulsion and converting the resultant pseudo-emulsion into a stable emulsion by admixing (ii) and a water soluble cellulose derivative protective colloid therewith.

3,922,241

ASBESTOS-FREE HEAT-RESISTANT THERMOSETTABLE PHENOL-ALDEHYDE MOLDING COMPOSITION

Richard H. Barker, Dalton, and Frank P. Florentine, Pittsfield, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed June 12, 1974, Ser. No. 478,785

Int. Cl.² C08L *1/02*

U.S. Cl. 260—17.2 **6 Claims**

1. An asbestos-free, heat-resistant thermosettable phenol-aldehyde molding composition consisting essentially of in admixture, a phenol-aldehyde resin and a filler combination of aluminum silicate, talc and cellulose fibers; said filler combination present in an amount of from about 15 to about 50 weight percent based on the weight of the molding composition.

3,922,242

PYRIDINE INSECTICIDES

Arthur Charles Henry, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 348,549, April 6, 1973, abandoned. This application Jan. 25, 1974, Ser. No. 436,760

Int. Cl.² C07D *213/36*

U.S. Cl. 260—296 R **5 Claims**

1. A resonance hybrid in which the two significant forms which contribute thereto are represented by the respective formulae:

wherein

R is straight-chain alkyl of from one to six carbon atoms; 1-methyl-d_3; isobutyl; alkenyl of two or three carbon atoms; alkoxyalkyl of two or three carbon atoms; cycloalkylmethyl of from four to seven carbon atoms; benzyl; benzyl substituted at the 3 and/or 4 positions by one or more of alkyl of one to four carbon atoms; halogen and nitro;

n is zero or 1;

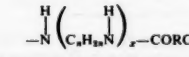
R′ is alkyl of from one to four carbon atoms.

3,922,243
KETENE DIMER MODIFIED WATER-DISPERSIBLE THERMOSETTABLE CATIONIC RESINS

Paul H. Aldrich, Greenville, and David H. Dumas, Hockessin, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Aug. 31, 1973, Ser. No. 393,690
Int. Cl.² C08L *77/06;* **C08G** *69/48*
U.S. Cl. 260—29.2 EP **4 Claims**

1. A composition consisting essentially of an aqueous dispersion of a water-insoluble, water-dispersible thermosettable cationic resin derived by reacting (I) an epihalohydrin and (II) a water-insoluble modified aminopolyamide derived by reacting (a) a water-soluble long chain aminopolyamide derived by reaction of a polyalkylenepolyamine and a dicarboxylic acid, said aminopolyamide having recurring groups



wherein n is an integer 2 through 6, x is an integer 2 through 4, and R is a divalent hydrocarbon radical, and (b) a ketene dimer having the formula $[R_1CH{=}C{=}O]_2$ where R_1 is a hydrocarbon radical selected from the group consisting of alkyl having at least 8 carbon atoms, cycloalkyl having at least 6 carbon atoms, aryl, aralkyl and alkaryl, said ketene dimer having a total of from about 16 to about 36 carbon atoms, the amount of ketene dimer employed being that sufficient to provide a modified aminopolyamide that is water-insoluble but insufficient to react with more than about 50% of the secondary amine groups of the aminopolyamide, the amount of epihalohydrin employed being at least that amount sufficient to react with substantially all the secondary amine groups of the modified aminopolyamide.

3,922,244
THERMOSETTING WATER-BASED COATINGS

Dwight L. Stephens, and Jeffrey D. Lord, both of Ross Township, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,404
Int. Cl.² C08L *9/08, 23/08, 61/28*
U.S. Cl. 260—29.7 UA **6 Claims**

1. A thermosetting water based coating composition containing by weight of the composition:

a. 2–10 percent of the ammonium salt of an ethylene-acrylic acid copolymer containing 15–25 weight percent acrylic acid;
b. 20–30 percent of a terpolymer of styrene, butadiene, and unsaturated carboxylic acid containing 50–70 weight percent styrene and having an acid number of 15–25;
c. 1–5 percent of an aminoplast;
d. 0–20 percent of pigment;
e. 0–3 percent of wax;
f. 45–60 percent of water; and
g. 0–4 percent of C_2 to C_8 alcohol.

3,922,245
WASH COATING FOR SAND CORES AND SAND MOLDS CONTAINING A RUBBER POLYMER

Michael J. Skubon; John J. Spiwak, both of Columbus, and Rodney L. Naro, Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 26, 1974, Ser. No. 464,572
Int. Cl.² B05D *1/00;* **C08K** *5/02*
U.S. Cl. 260—33.8 UA **2 Claims**

1. a core and mold wash comprising:

a. an organic liquid solvent having a kauri-butanol value of at least 36;
b. a suspending agent;
c. powdered refractory material selected from the group consisting of graphite, coke, mica, silica, aluminum oxide, magnesium oxide, talc, and zircon flour; and
d. an organic polymer selected from the group consisting of vinyl toluene/butadiene copolymer, styrene/butadiene copolymer, vinyl toluene/acrylate copolymer, styrene-/acetylene copolymers, and acrylates,

the ratio by weight of organic polymer to organic liquid solvent being between about 1:50 and about 1:200 and the ratio by weight of powdered refractory to organic liquid solvent being between about 1:2.5 and 1:3.5.

3,922,246
ORGANOPOLYSILOXANE COMPOSITIONS WHICH CURE AT AMBIENT TEMPERATURE

Louis Ceyzeriat, Lyon, and Michel Letoffe, Ste-Foy-les-Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Mar. 4, 1974, Ser. No. 447,501
Claims priority, application France, Mar. 7, 1973, 73.08143
Int. Cl.² C08L *83/00*
U.S. Cl. 260—37 SB **8 Claims**

1. An organopolysiloxane composition which consists essentially of a mixture of the following ingredients, by weight:

i. 100 parts of a α,ω-dihydroxydiorganopolysiloxane polymer, of viscosity at least about 600 cPo at 25°C, consisting essentially of diorganosiloxy units, the organic radicals bonded to the silicon atoms being selected from alkyl radicals with one to three carbon atoms, halogenalkyl radicals with three or four carbon atoms, the vinyl radical, aryl or halogenoaryl radicals with six to eight carbon atoms or cyanoalkyl radicals with three or four carbon atoms, with the proviso that at least 50% of these organic radicals are methyl radicals;

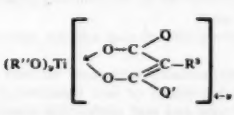
ii. 1 to 15 parts of an organosilicon compound which is either:

a. a monomer of the formula (A): $R_xSi[(OCH_2CH_2)_aOR']_{4-x}$, in which R represents a hydrogen radical with one to eight carbon atoms, R′ represents an alkyl radical with one to four carbon atoms, and x and a independently represent zero or 1, or
b. a polymer resulting from the partial hydrolysis of at least one monomer of formula $Si(OR')_4$, in which R′ is as defined above;

iii. 0.2 to 6 parts of an organic derivative of titanium, which is either:

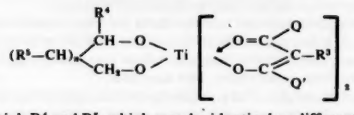
a. a monomer of the formula (B): $Ti[(OCH_2CH_2)_bOR'']_4$, in which R″ represents an alkyl radical with one to 10 carbon atoms and b represents zero, one or 2; such that when b is zero, the alkyl radical has three to 10 carbon atoms and when b is 1 or 2, the alkyl radical has one to four carbon atoms,
b. a polymer resulting from the partial hydrolysis of at least one monomer of the formula $Ti(OR'')_4$, in which R″ represents an alkyl radical with three to 10 carbon atoms,

c. a titanium chelate of the formula (C):



in which Q represents an alkyl radical with one to four carbon atoms, a phenyl radical or an alkoxy radical with one to three carbon atoms; R″ represents an alkyl radical of three to 10 carbon atoms; y represents 2 or 3; R^3 represents a hydrogen atom, a methyl radical or a chloromethyl radical; Q′ represents an alkyl radical with one to five carbon atoms or a chloromethyl radical; or R^3 and Q′, together with the two carbon atoms to which they are attached, together form a phenyl nucleus, in which case Q represents an alkoxy radical or a hydrogen atom, or

d. a titanium chelate of the formula (D):



in which R^4 and R^5, which may be identical or different, represent hydrogen atoms or methyl radicals; Q, Q' and R^3 are as defined above and *n* represents zero or 1;

iv. 0 to 100 parts of an optionally organosilicon-treated inorganic filler;

v. 0 to 100 parts of plasticiser and/or organosilicon stabiliser and;

vi. 0.5 to 8 parts of an organosilicon resin consisting of units of the formulae $R'''(CH_3)_2SiO_{0.5}$ and SiO_2, in which R''' represents an alkyl radical with one to three carbon atoms or the vinyl radical and the ratio of the number of $R'''(CH_3)_2SiO_{0.5}$ units to the number of SiO_2 units is from about 0.4/1 to about 1.2/1.

3,922,247

HANDLEABLE, MOLDABLE ESTER-TYPE RESIN COMPOSITIONS

Stanley M. Hazen, Cheswick, and William J. Heilman, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 15, 1973, Ser. No. 370,365
Int. Cl.² C08L *63/10, 67/06*
U.S. Cl. 260—40 R **12 Claims**

1. A method of preparing a thermosettable, moldable composition which comprises C.

forming a liquid solution of a resin mixture consisting essentially of an unsaturated polyester or vinyl ester resin, an olefinically unsaturated monomer containing as its only functional groups at least one olefinic double bond capable of polymerization by free radical means, and benzoyl peroxide, wherein said unsaturated polyester resin is the reaction product of at least one diol and at least one unsaturated dicarboxylic acid or unsaturated dicarboxylic anhydride and said vinyl ester resin is the reaction product of an epoxide having an epoxy equivalent value greater than one with an ethylenically unsaturated monocarboxylic acid;

preparing a composite of said solution and a fibrous substrate;

partially copolymerizing said resin mixture through said olefinic double bonds of said unsaturated polyester or vinyl ester resin and said olefinically unsaturated monomer by free radical means by heating said composite to a temperature between about 75° C. and about 95° C. to thicken said composite to a thermosettable, moldable composition comprising a homogeneous mixture of unsaturated polyester or vinyl ester resin, olefinically unsaturated monomer, copolymer get and fibrous substrate; and

cooling said composite below the copolymerization temperature of said resin mixture following said partial vinyl polymerization.

3,922,248

FLAME AND SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 438,724, Feb. 1, 1974, Pat. No. 3,883,482.
This application Sept. 3, 1974, Ser. No. 502,295
Int. Cl.² C08F *6/00*
U.S. Cl. 260—45.75 C **8 Claims**

1. A flame and smoke retardant composition comprising (1) a vinyl chloride or vinylidene chloride polymer and (2) a compound selected from the group consisting of Cu_2S, CuS, FeS, and mixtures thereof, said compound being present in an amount of from about 0.25 to about 10 weight parts per 100 weight parts of polymer and having an average particle size of from about 100 microns to about 0.5 micron.

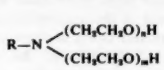
3,922,249

STABILIZED ANTISTATIC COMPOSITIONS USEFUL WITH OLEFIN POLYMERS

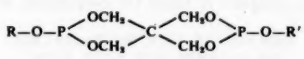
Kenneth R. Mills, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1973, Ser. No. 350,531
Int. Cl.² C08K *5/17, 5/52;* **C09K** *15/32*
U.S. Cl. 260—45.8 R **11 Claims**

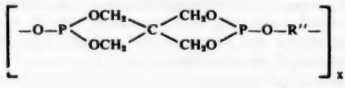
1. An antistatic composition stabilized against discoloration comprising an antistatic agent selected from at least one tertiary amine represented by the formula



wherein *n* is an integer of at least one, m is an integer of at least one, and $n + m$ ranges from 2 to 50, R is an alkyl group containing seven to 20 carbon atoms; and admixed therewith a pentaerythritol derivative phosphite compound selected from the group consisting of



wherein R and R' are the same or different selected from the group consisting of alkyl, cycloalkyl, aryl, alkoxyalkyl, the halo-substituted derivatives thereof containing from one to 20 carbon atoms and mixtures thereof and a polymeric phosphite containing the recurrent structural unit



wherein R'' is the alkylene residue of a dihydric alcohol, the arylene residue of a dihydric phenol and the halo-substituted derivatives thereof and *x* is an integer of at least 2.

3,922,250

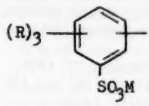
LATE ADDITION OF ALKALI METAL SULFONATE DYE RECEPTIVITY ADDITIVE IN POLYESTERIFICATION PROCESS

James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

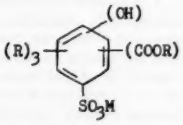
Filed Sept. 3, 1974, Ser. No. 502,808
Int. Cl.² C08G *63/68*
U.S. Cl. 260—49 **12 Claims**

1. In a polyesterification process comprising contacting a dicarboxylic acid or its ester-forming derivative and a diol under polyester-forming conditions, the improvement comprising adding an effective dye receptivity improving amount

of a sulfonate compound having the general formula



or



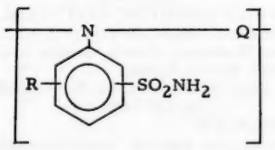
wherein each R is selected from hydrogen or alkyl radicals having from one to five carbon atoms and M is an alkali metal, said sulfonate being introduced into said polyesterification process after initial esterification or transesterification is essentially complete, as determined by evolution of 80 to 100 percent of theoretical amount of water or alcohol from the initial esterification or transesterification, there being present in addition an effective viscosity-modifying amount of an alkali metal hydroxide during at least a portion of said polyesterification reaction.

3,922,251
NOVEL SULFANILAMIDE-ALDEHYDE COPOLYMER

Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 291,847, Sept. 25, 1972, abandoned. This application June 19, 1974, Ser. No. 480,893
Int. Cl.² C08G *12/08*
U.S. Cl. 260—72.5 **6 Claims**

1. A water-insoluble amine-aldehyde copolymer having a number average molecular weight of about 350–2000 and consisting essentially of repeating units corresponding to the formula:



wherein Q is the aldehyde residue and R is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, halo, nitro, acetamido, or sulfonamido.

3,922,252
POLYAMIDEIMIDE COMPOSITIONS

Fred R. Holub, Schenectady; Peter J. Cacciotti, Rensselaer, and Denis R. Pauze, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,866
Int. Cl.² C08G *18/00*
U.S. Cl. 260—75 N **11 Claims**

1. The process of preparing polyamideimide which comprises (a) reacting tricarboxylic acid anhydride material with diol, (b) reacting the reaction product of (a) with poly-primary amine in about equimolar amount with respect to said anhydride and (c) heating the reaction product of (b) to remove substantially all diol.

3,922,253
SELF-CROSSLINKING CATIONIC ELECTRODEPOSITABLE COMPOSITIONS

Robert D. Jerabek, Glenshaw, and Joseph R. Marchetti, Greensburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 193,591, Oct. 28, 1971, abandoned. This application Sept. 24, 1973, Ser. No. 400,286
Int. Cl.² C08G *18/80*
U.S. Cl. 260—77.5 TB **3 Claims**

1. A method of preparing an electrodepositable resin which comprises reacting:

A. an epoxy group-containing organic resin with:

B. a primary or secondary amine, and reacting the resultant product with

C. a semi-blocked organic polyisocyanate containing an average of about one free isocyanate group where the blocked isocyanate groups are stable at ordinary room temperature in the presence of said product, but reactive with hydroxyl groups at elevated temperatures.

3,922,254
CATALYTIC PROCESS FOR IMIDE-ALCOHOL CONDENSATION

Ross Melvin Hedrick, Creve Coeur, and James D. Gabbert, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

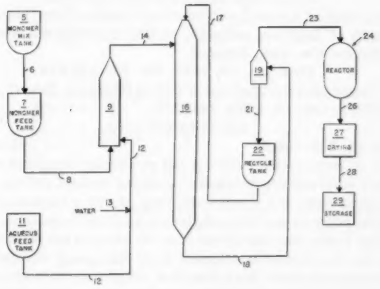
Filed July 22, 1974, Ser. No. 490,439
Int. Cl.² C08G *69/16*
U.S. Cl. 260—78 L **12 Claims**

1. A catalyzed imide-alcohol condensation process for the preparation of polymeric compounds of polyester-polyamide comprising: contacting alcohols having one or more hydroxyl groups attached to an aliphatic carbon, and acyl lactams in the presence of at least one of a Group IA, IIA, IIB, and IIIA metal or metal compound.

3,922,255
METHOD OF PRODUCING UNIFORM POLYMER BEADS

Donald J. Koestler, Philadelphia, and Melvin Barry Robin, Elkins Park, both of Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 254,633, May 15, 1972. This application June 3, 1974, Ser. No. 475,716
Int. Cl. C08f *1/11*
U.S. Cl. 260—80.78 **11 Claims**



1. A method of suspension polymerization for providing substantially uniform particles of polymer beads comprising a polymer or copolymer derived from the monomers suitable for suspension polymerization and selected from one or more of a monovinyl monomer and a polyvinyl monomer, which comprises:

a. forming in a first feed vessel a liquid mixture of the polymerizable monomer or monomers, and a suitable poly-

merization initiator, at a temperature level which essentially inhibits the initiation of polymerization;

b. separately preparing in a second feed vessel an aqueous liquid that is suitable for maintaining a dispersion of liquid droplets of said monomer mixture;

c. passing the monomer containing liquid from said first vessel through a first conduit into one end of a first column to flow therethrough;

d. passing said monomer liquid into said column through a mechanical means having a plurality of orifices each having a diameter size ranging from 0.004 to 0.015 inches with a jet velocity ranging from 0.25 to 10.00 cc/minute/orifice;

e. concurrently passing the aqueous liquid, which is substantially immiscible with said monomer, from said second vessel through a second conduit to said first column at a rate sufficient to stabilize the monomer droplets, where the effluent of said second conduit is in close proximity to said effluent of the first conduit;

f. passing the droplet-containing third liquid from the other end of said first column through a third conduit into the upper section of a second column to flow therethrough at a temperature to initiate polymerization of monomer within the droplets;

g. concurrently introducing into the upper section of said second column via a fourth conduit a downflowing aqueous stream at a flow rate which will allow the more buoyant monomer droplets residence time sufficient to reach a point of polymerization whereby the droplets will no longer lose their particulate identity as beads;

h. allowing the partially polymerized droplets while dispersed in the aqueous liquid to flow from the lower section of said second column through a fifth conduit to a system for gravity separation and for concentrating said beads in said aqueous liquid;

i. allowing a comparatively concentrated slurry of said beads to flow from said separation system through a sixth conduit to a polymerization zone wherein said beads are further polymerized to the extent desired under temperature conditions suitable to that purpose; and

j. transferring the polymerized beads from the lower portion of said polymerization zone through a seventh conduit for further processing.

3,922,256

POLYMER TREATMENT PROCESS

John Michael Locke, Lyndhurst, and Martin Viney, Highcliffe, both of England, assignors to The International Synthetic Rubber Co., Ltd., England

Filed Jan. 19, 1973, Ser. No. 324,970

Claims priority, application United Kingdom, Jan. 21, 1972, 3057/72; Oct. 12, 1972, 74123/72

Int. Cl.² C08J *3/08*

U.S. Cl. 260—80.78 **16 Claims**

1. A process for lowering the molecular weight of a normally solid starting polymer containing tertiary carbon atoms selected from the group consisting of (1) a saturated alpha olefin polymer and (2) ethylene-propylene terpolymers having an iodine number of less than 20 wherein the termonomer in the terpolymer is selected from the group consisting of dicyclopentadiene, hexadiene-1,4, ethylidene norbornene and methylene norbornene which comprises intimately mixing (A) a solution of starting polymer in a solvent selected from the group consisting of a hydrocarbon, a halogenated hydrocarbon and mixtures thereof, with (B) an aluminum halide selected from the group consisting of aluminium tribromide and ball milled aluminium trichloride, reacting at a temperature below 100°C and after said reaction recovering the alpha olefin polymer of lowered molecular weight which has an intrinsic viscosity of 0.1 to 1.0 measured as a 0.1% by weight solution in toluene at 25°C.

3,922,257

PREPARATION OF FIBROUS COPOLYMERS OF PROPYLENE AND ETHYLENE

Harry W. Blunt, Hockessin, and Benjamin C. Repka, Newark, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 184,188, Sept. 27, 1971, abandoned. This application Oct. 12, 1973, Ser. No. 406,133

Int. Cl.² D01F *6/30*; C08F *2/06, 4/16, 10/06*

U.S. Cl. 260—88.2 **3 Claims**

1. A process for producing high yields of nascent fibers of substantially crystalline copolymers of propylene and ethylene, said copolymers containing 1.5 to 6.8 weight % of ethylene and having an intrinsic viscosity greater than 2.0 and at least 60 % of said nascent fibers having an average diameter of 3 to 12 mils and an average length of 125 to 250 mils, which process consists essentially of the steps of introducing a catalytic amount of $TiCl_3$ into a reaction medium consisting essentially of a saturated aliphatic or alicyclic hydrocarbon diluent containing from six to 12 carbon atoms, a dialkylaluminum halide activator, and a monomer mixture of propylene and from 2.2 up to about 10 molar % of ethylene, agitating the reaction medium under polymerization conditions at a temperature ranging from about 40° to about 70°C. using sufficient agitation to insure adequate contact of the monomer mixture, $TiCl_3$ and dialkyl aluminum halide activator until fibers of said copolymer are produced and then recovering the fibrous product from the reaction medium at a temperature of 70°C. or below, said catalytic amount of $TiCl_3$ ranging from about 1 to about 20 millimoles per liter of diluent and the molar ratio of activator to $TiCl_3$ ranging from 1:1 to 10:1.

3,922,258

METHOD OF IMPROVING HEAT STABILITY OF EMULSION POLYMERIZED POLYVINYL CHLORIDE

Hans Walser, Westmount, Canada, assignor to Gulf Oil Canada Limited, Toronto, Canada

Filed Oct. 29, 1974, Ser. No. 518,660

Int. Cl.² C08F *6/14*

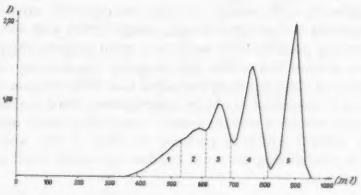
U.S. Cl. 260—92.8 W **4 Claims**

1. In the aqueous emulsion homoplymerization of vinyl chloride monomer with a free radical producing redox polymerization initiator under pressure sufficient to maintain emulsified vinyl chloride in the liquid phase at a desired polymerization temperature (a) which is not above 40°C, the polymerization being terminated at a monomer conversion (b) which is not more than 97.5% with subsequent removal of unpolymerized vinyl chloride monomer from product polyvinyl chloride emulsion by venting, where (a) and (b) correspond to the co-ordinates of any point lying within the area substantially delineated by ABCD in the accompanying drawing, the improvement comprising heating the polyvinyl chloride emulsion immediately prior to removal of the unpolymerized monomer therefrom, at a temperature of about 50°–70°C for a period of time of at least 10 minutes and sufficient to destroy residual free radicals in the emulsion and thereby increase the heat stability of the polyvinyl chloride to a value of at least 10 minutes before appearance of yellow coloring of the polyvinyl chloride when plasticized with an equal weight of di(2-ethylhexyl) phthalate plasticizer containing 3% by weight of barium-cadmium-zinc phenate type stabilizer and heated to 188°C.

3,922,259
POLYMERS OF THE KUNITZ INHIBITORS, NEW MEDICAMENTS CONTAINING THESE POLYMERS AND METHOD FOR THEIR MANUFACTURE

Edgar Sach, Bures-sur-Yvette, and Claude Raby, Chaville, both of France, assignors to Choay S.A., Paris, France

Filed Nov. 27, 1972, Ser. No. 309,834
Int. Cl.² C07C *103/52*
U.S. Cl. 260—112.5 24 Claims

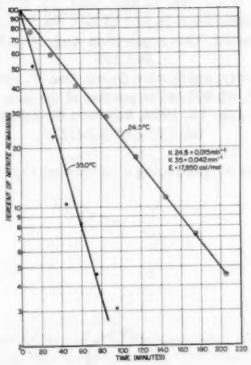


1. A Kunitz inhibitor polymer which has at least the molecular weight of a dimer.

3,922,260
PROCESS FOR DEPOLYMERIZATION OF CHITOSAN

Quintin P. Peniston, Rte. 7, Box 7710, Bainbridge Island, Wash. 98110, and Edwin Lee Johnson, Rte. 5, Box 4246, Issaquah, Wash. 98027

Filed Aug. 24, 1973, Ser. No. 391,270
Int. Cl.² C07C *95/04*
U.S. Cl. 260—211 R 2 Claims



1. A process for the deaminative cleavage of chitosan into fragments, consisting essentially of treating the chitosan in a mild acidic solution with sodium nitrite as a source of nitrous acid, and controlling the rate of nitrite consumption by the chitosan to produce amino polysaccharide fragments consisting of linear chains of 2-deoxy-2 amino glucose units having one terminal unit in the form of an aminefree reducing sugar and to produce a degree of polymerization ranging from the di-saccharide to nearly that of the original chitosan.

3,922,261
ADENOSINE DERIVATIVE

Rolf Pohlke; Werner Mehrhof; Karl-Heinz Becker; Hans-Jochen Schliep; Herbert Nowak, and Zdenek Simane, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed June 20, 1973, Ser. No. 371,779
Claims priority, application Germany, June 21, 1972, 2230160
Int. Cl.² C07H *19/16*
U.S. Cl. 260—211.5 R 2 Claims

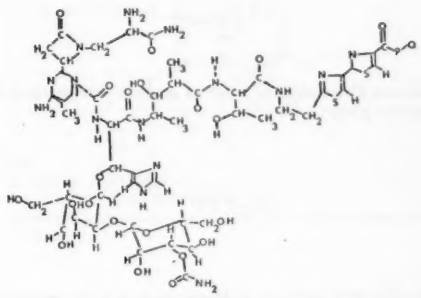
1. A member of the group consisting of N^6-(1,2,3,4-tetrahydronaphthyl-2-)-adenosine, the optical isomer thereof having a melting point of 164°–166° C. and the optical isomer thereof having a melting point of 175°–176° C.

3,922,262
N-SUBSTITUTED DERIVATIVES OF BLEOMYCINS

Hamao Umezawa, Tokyo; Yuya Nakayama, Yono; Mamoru Kunishima, and Midori Matsubara, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

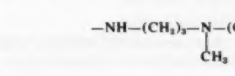
Continuation-in-part of Ser. No. 291,178, Sept. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 248,631, April 28, 1972, abandoned. This application Jan. 7, 1974, Ser. No. 431,130
Claims priority, application Japan, Apr. 28, 1971, 46-27553; Sept. 29, 1971, 46-75430
Int. Cl.² C07C *103/52*; A61K *37/00, 31/71*
U.S. Cl. 260—112.5 24 Claims

1. A novel N-substituted bleomycin derivative having the following structure:



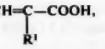
wherein

P = —NH—$(CH_2)_3$—NH—; —NH—$(CH_2)_3$—NH—$(CH_2)_3$—NH—, —NH—$(CH_2)_3$—NH—$(CH_2)_4$—NH—, —NH—$(CH_2)_3$—NH—$(CH_2)_6$—NH— or

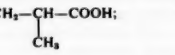


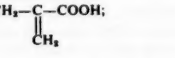
Q = —COR, where R is hydrogen, a C_1–C_{11} alkyl group, a C_1–C_2 halogen-substituted alkyl group, a crotonoyl group, a phenyl group, a p-nitrophenyl group, a benzyl group, a p-nitrobenzyl group, a phenoxymethyl group, a cinnamyl group, a naphthyl group, a nicotinyl group, an isonicotinyl group, a furyl group or a thenyl group;

=—CO—$(CH_2)_{n_1}$—COOH, where n_1 is an integer of 2 to 7;



where R^1 is hydrogen or a methyl group;





-R^2, where R^2 is an allyl group or a p-nitrobenzyl group;

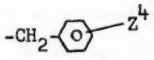
—SO_2R^3, where R^3 is a C_1–C_2 alkyl group,

(wherein Z is hydrogen, a methyl group, a chlorine atom or a nitro group) or a naphthyl group;

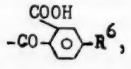
—CONHR[4], where R^4 is C_1–C_4 alkyl group, a cyclohexyl group, a phenyl group, a p-tolyl group or a naphthyl group;

where R^5 is hydrogen, a C_1–C_8 alkyl group, $-(CH_2)_3NZ^1Z^2$ (wherein Z^1 and Z^2 are hydrogen or a methyl group, respectively),

(wherein Z^3 is hydrogen, a methyl group, a nitro group or a methoxy group),



(wherein Z^4 is hydrogen, a chlorine atom or a nitro group), a styryl group or a naphthylmethyl group;



where R^6 is hydrogen or a nitro group; and

—$(CH_2)_2C$ ≡ N; and its pharmaceutically effective inorganic acid addition salt and the metal chelates thereof.

3,922,263

HYPOGLYCEMIC COMPOUND AND METHOD OF PREPARING

Carlton E. Turner, and John C. Craig, Jr., both of Oxford, Miss., assignors to The University of Mississippi, University, Miss.

Filed Dec. 16, 1974, Ser. No. 533,347
Int. Cl.[2] C07G 17/00; A61K 35/78
U.S. Cl. 260—236.5 **4 Claims**

1. The method of preparing a compound glycosidic from cockleburrs (*Xanthium strumarium*) comprising the steps of first, coarsely grinding the cockleburrs, extracting the ground cockleburrs with water, second, successively treating the biologically active agent in said water extract with solvents of decreasing polarity from water to a point wherein the polarity of the solvent lies within the range of the polarity of a 5% solution of chloroform in methanol to a 95% solution of chloroform in methanol to obtain a precipitate, third, washing said precipitate with a solvent system comprising water and a less polar solvent which is partially miscible in the water, and fourth crystallizing the solid residue recovered from said solvent system.

3,922,264

PRODUCTION OF BENZODIAZEPINE DERIVATIVES

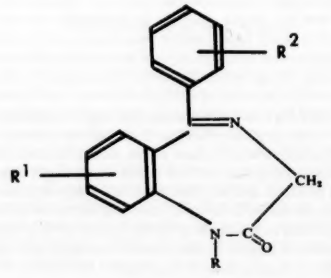
Hisao Yamamoto, Nishinomiya; Shigeho Inaba, Takarazuka; Tadashi Okamoto, Ashiya; Toshiyuki Hirohashi, Kobe; Kikuo Ishizumi, Minoo; Michihiro Yamamoto, Takarazuka; Isamu Maruyama, Minoo; Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 74,464, Sept. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 780,211, Nov. 29, 1968, abandoned. This application Aug. 30, 1973, Ser. No. 393,193

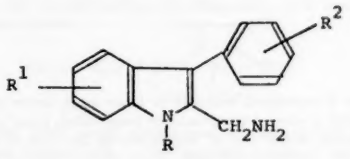
Claims priority, application Japan, Dec. 7, 1967, 42-78812; Dec. 14, 1967, 42-80324The portion of the term of this patent subsequent to Jan. 12, 1988, has been disclaimed.

Int. Cl.[2] C07D 243/36
U.S. Cl. 260—239.3 D **4 Claims**

1. A process for producing a compound represented by the formula,



wherein R is monohalogeno-C_1-C_4-alkyl, dihalogeno-C_1-C_4-alkyl, trihalogeno-C_1-C_4-alkyl or C_1-C_3-alkoxy-substituted C_1-C_4-alkyl; R^1 is hydrogen, halogen or nitro; and R^2 is hydrogen, halogen, C_1-C_3-alkyl, halogeno-C_1-C_3-alkyl, C_1-C_3-alkoxy or nitro, or their acid-addition salts, which comprises reacting a 1-substituted 2-aminomethylindole compound represented by the formula,



II

wherein R, R^1 and R^2 have the same meanings as defined above, or an acid-addition salt thereof with at least the stoichiometric amount of an oxidizing agent selected from the group consisting of ozone, hydrogen peroxide, performic acid, peracetic acid, perbenzoic acid, chromic acid and potassium permanganate in the presence of a solvent selected from the group consisting of water, acetone, carbon tetrachloride, acetic acid and sulfuric acid.

3,922,265
REARRANGEMENT OF AMINOCYCLOALKANONE OXIMES TO THE CORRESPONDING LACTAMS

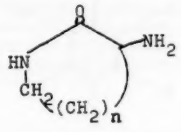
Robert Fuhrmann, Morris Plains; Allen A. Tunick, Denville, and Stylianos Sifniades, Madison, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,967

Int. Cl.² C07D *223/10, 211/76*

U.S. Cl. 260—239.3 R **8 Claims**

1. A method for the production of an α-amino-ω-lactam of the formula:



wherein *n* is an integer of 2 or 3, comprising the steps of:

a. contacting the corresponding α-aminocycloalkanone oxime or mineral acid salt thereof with liquid sulfur dioxide containing at least about 1 mole sulfur trioxide per mole α-aminocycloalkanone oxime until a two-phase system comprising a liquid SO_2 phase and an insoluble lactam precursor phase is formed;

b. separating the liquid sulfur dioxide phase from the insoluble phase containing the lactam precursor;

c. hydrolyzing and neutralizing the insoluble lactam precursor phase; and

d. recovering the free lactam product.

6. The method of claim **1** wherein the α-aminocycloalkanone oxime is α-aminocyclohexanone oxime.

3,922,266
ARYL KETONES AND PRODUCTION THEREOF

Junki Katsube, Toyonaka; Masaru Nakao, Osaka; Kikuo Sasajima, Toyonaka; Isamu Maruyama; Masaharu Takayama, both of Minoo; Keiichi Ono, Osaka; Shigenari Katayama, Takarazuka; Yoshihiro Tanaka, Takarazuka; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

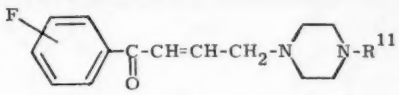
Filed Dec. 18, 1972, Ser. No. 316,026

Claims priority, application Japan, Sept. 22, 1972, 47-95720; July 12, 1972, 47-70265; July 12, 1972, 47-70266; June 28, 1972, 47-65208

Int. Cl.² C09B *23/00;* **C07D** *295/00*

U.S. Cl. 260—240 J **3 Claims**

1. A compound of the formula:



wherein R^{11} is alkoxyphenyl in which the alkoxy group has 1 to 4 carbon atoms.

3,922,267
SUBSTITUTED SULFONYLACETAMIDO CEPHALOSPORINS

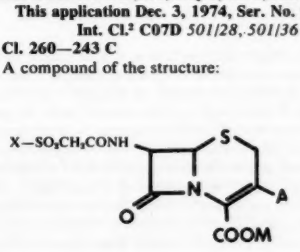
Robert M. De Marinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 249,858, May 3, 1972, Pat. No. 3,865,819. This application Dec. 3, 1974, Ser. No. 529,167

Int. Cl.² C07D *501/28, 501/36*

U.S. Cl. 260—243 C **6 Claims**

1. A compound of the structure:



where:

X is lower alkyl of C_1—C_6;

A is CH_2OR, or CH_2SR; and

M is hydrogen, alkali metal cation, or nontoxic ammonium cation.

3,922,268
3-HALOMETHYL-Δ³-CEPHALOSPORIN ESTERS

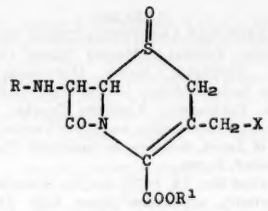
Charles F. Murphy, and J. Alan Webber, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 883,231, Dec. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 811,640, March 28, 1969, abandoned. This application Aug. 10, 1970, Ser. No. 62,699

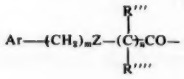
Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **6 Claims**

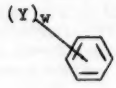
1. A compound having the formula



wherein X is chlorine, bromine or iodine; R is C_1 to C_6-alkanoyl, C_2 to C_6-chloroalkanoyl, or an acyl group of the formula



where Ar is 2-thienyl or



wherein *m* is an integer of from 0 to 4, *n* is an integer of from 1 to 4, Z is oxygen or sulfur or a chemical bond, R''' and R'''' are, separately, hydrogen or methyl, or when R''' is hydrogen, R'''' can be an N-protected amino selected from the group consisting of N-tert-butoxycarbonyl)amino, N-(benzyloxycarbonyl)-amino, N-(allyloxycarbonyl)amino, N-(cyclopentyloxycarbonyl)-amino, and N-(2-methoxycarbonyl-1-methylvinyl-)amino and *n* is 1; and Y is hydrogen or a substituent on the phenyl ring carbon atoms such as fluorine, chlorine, bromine, iodine, C_1 to C_3-alkyl, C_1 to C_3-alkyloxy, N-protected-alpha-amino-C_1 to C_3-alkyl, butoxycarbonyl, nitro, cyano, trifluoromethyl and *w* is an integer of from 1 to 2; and R' is 2,2,2-trichloroethyl, C_4 to C_6-tert-alkyl, C_5 to C_7-tert-alkenyl, C_5 to C_7-tert-alkynyl, benzyl, methoxybenzyl, nitrobenzyl, phenacyl, phthalimidomethyl, or succinimidomethyl.

3,922,269

OXIMES OF 3-FORMYLCYCLOPROPANE CARBOXYLIC ACID ESTERS

Michael Elliott, Harpenden; Norman Frank Janes, Luton, and David Allen Pulman, Harpenden, all of England, assignors to National Research Development Corporation, London, England

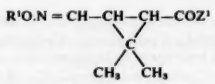
Filed Dec. 20, 1973, Ser. No. 427,622

Claims priority, application United Kingdom, Dec. 21, 1972, 59185/72; Aug. 31, 1973, 41048/73

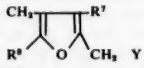
Int. Cl.² C07D *307/46*

U.S. Cl. 260—347.4 **9 Claims**

1. A cyclopropane carboxylic acid or derivative thereof of the formula:



wherein R^1 represents hydrogen or an alkyl or alkenyl group containing up to 6 carbon atoms and Z^1 represents halogen or OR where R represents hydrogen, an alkali metal, silver or triethylammonium, or an alkyl group containing up to 6 carbon atoms or a group of the formula:



III

wherein Y represents hydrogen or lower alkyl, lower alkenyl or phenyl or phenyl substituted by lower alkyl, lower alkoxy or chlorine, and R^7 and R^8, which may be the same or different, each represent hydrogen or an alkyl or alkenyl group containing up to 4 carbon atoms.

3,922,270

PROCESS FOR THE PREPARATION OF ACID NITRO DYESTUFFS

Hasso Hertel, Muhlheim, Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

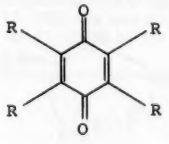
Filed Jan. 29, 1974, Ser. No. 437,697

Claims priority, application Germany, Feb. 2, 1973, 2305048

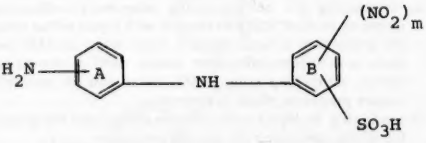
Int. Cl.² C07C *143/58*

U.S. Cl. 260—396 R **1 Claim**

1. In a process of the preparation of acid nitro dyestuffs by condensation of a benzoquinone with an aminonitrodiphenylaminesulfonic acid in the presence of manganese dioxide which comprises condensing 1 mol of a benzoquinone of the formula



in which the R is identical or different and each is hydrogen, alkyl of 1 to 4 carbon atoms or chlorine, with 2 mols of a compound of the formula



in which *m* is 1 or 2 and the benzene nuclei A and B may be substituted by chlorine, bromine, lower alkyl or lower alkoxy, the improvement consisting of carrying out the condensation at a pH-value of from 3 to 6.

3,922,271
SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

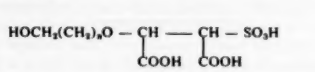
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application July 1, 1974, Ser. No. 484,741

Int. Cl.² C07D *295/00;* **C07C** *143/00*

U.S. Cl. 260—247.1 E **8 Claims**

1. An α-hydroxyalkoxy-β-sulfosuccinic acid having the general formula:



and the alkali metal, ammonium, monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium or N-ethylmonoethanolammonium salt thereof, wherein *n* is an integer from 1 to 7.

3,922,272
SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

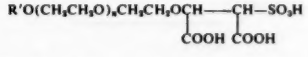
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application July 1, 1974, Ser. No. 484,744

Int. Cl.² C07D *295/00;* **C07C** *143/00*

U.S. Cl. 260—247.1 E **5 Claims**

1. An α-alkoxypolyethyleneoxy-βammonium, acid having the general formula:



and the alkali metal, ammoonium, or substituted ammonium salt forms of the acid wherein the substituted ammonium salts are selected from the group consisting of monoethanolammonium, diethanolammonium, triethanolammoniuim, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium and N-ethylmonoethylammonium wherein R′ is an alkyl group containing 1–24 carbon atoms and n is zero or an integer from 1–15.

3,922,273
CYCLIZATION OF GLYOXYLIC ACID SEMICARBAZONE

Daniel H. Deutsch, 141 Kenworthy Drive, Pasadena, Calif. 91105

Filed Nov. 1, 1974, Ser. No. 520,004

Int. Cl.² C07D *253/06*

U.S. Cl. 260—248 AS **8 Claims**

1. A method of cyclizing glyoxylic acid semicarbazone comprising.

mixing glyoxylic acid semicarbazone with a single high boiling alcohol solvent therefor;

adding a basic material to said solution;

heating said solution for a period of time sufficient to cyclize said semicarbazone; and

recovering the formed salt of 6-azauracil.

3,922,274
DIHYDRO-1,2,4-TRIAZINOQUINAZOLINES

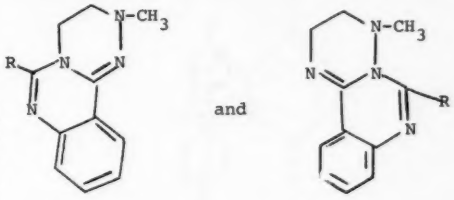
Donald L. Trepanier, and Shyam Sunder, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1974, Ser. No. 520,573

Int. Cl.² C07D *253/08*

U.S. Cl. 260—248 AS **8 Claims**

1. A 1,2,4-triazino quinazoline selected from compounds corresponding to one of the formulae:



and

wherein R represents hydrogen, phenyl or substituted phenyl having one, two or three substituents selected from halo, cyano, and loweralkyl or loweralkoxy of one to three carbon atoms, and their pharmaceutically acceptable acid addition salts.

3,922,275
PYRIDO[2,3-D] PYRIMIDINE-2,4(1H,3H)-DIONES

Kanji Noda, Chikushino; Akira Nakagawa, Tosu, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Tosu, Japan

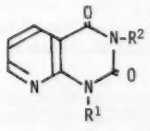
Continuation-in-part of Ser. No. 375,879, July 2, 1973, abandoned. This application Oct. 8, 1974, Ser. No. 513,079

Claims priority, application Japan, Nov. 9, 1972, 47-113161; Nov. 10, 1972, 47-113383

Int. Cl.² C07D *239/70*

U.S. Cl. 260—256.4 F **78 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of phenyl, halophenyl, dihalophenyl, tolyl and trifluoromethylphenyl; R^2 is selected from the group consisting of hydrogen, alkyl groups having from one to 3 carbon atoms, alkenyl group having from 3 to 5 carbon atoms, propargyl, cyclopropylmethyl, haloethyl, dihalomethyl, trihaloalkyl groups having from one to 2 carbon atoms, hydroxyalkyl groups having from 2 to 3 carbon atoms, acetoxyethyl, alkoxyalkyl groups having from 2 to 4 carbon atoms and 2-(2-hydroxyethoxy)ethyl.

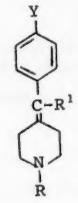
3,922,276

1-SUBSTITUTED-4-BENZYLIDENEPIPERIDINES

Robert Louis Duncan, Jr., and Robert Frederick Boswell, Jr., both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Dec. 11, 1974, Ser. No. 531,631
Int. Cl.² C07D 211/16
U.S. Cl. 260—293.76 8 Claims

1. A compound selected from 1-substituted-4-benzylidenepiperidine having the formula:



wherein;

R is selected from the group consisting of acetyl, p-fluorobenzoylpropyl, p-acetyl-o-methoxyphenoyxpropyl, carbamoyl, N-loweralkylcarbamoyl, N,N-di-lower-alkycarbamoyl, 2-hydroxy-3-(o-methoxyphenoxy)propyloxycarbonyl, N-phenylcarbamoyl optionally substituted in the phenyl ring by acetyl, lower-alkoxy, lower-alkyl, trifluoromethyl, chlorine, bromine or fluorine,

R^1 is selected from the group consisting of phenyl, p-fluorophenyl, m-trifluoromethylphenyl, or cyclohexyl,

Y is selected from the group consisting of hydrogen or fluorine, with the proviso that when Y is hydrogen and R^1 is phenyl, R is other than p-fluorobenzoylpropyl,

and the pharamceutically acceptable acid addition salts of the basic compounds thereof.

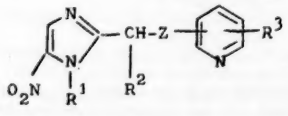
3,922,277

(1-ALKYL-5-NITRO-IMIDAZOLYL-2-ALKYL)-PYRIDYL COMPOUNDS

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 14, 1974, Ser. No. 523,917
Claims priority, application Germany, Nov. 16, 1973, 2357277
Int. Cl.² C07D 401/12
U.S. Cl. 260—294.8 F 8 Claims

1. A (1-Alkyl-5-nitro-imidazolyl-2-alkyl)-pyridyl-sulfide, -sulfoxide or -sulfone of the formula I



(1)

in which R^1 represents methyl or ethyl, R^2 represents a hydrogen atom or methyl, Z represents a sulfide group (—S—), a sulfoxide group (—SO—) or a sulfone group ($—SO_2—$), which is linked with the pyridine ring in the 2-, 3- or 4-position, and in which R^3 represents a halogen atom, a cyano or nitro group.

3,922,278

4-(3-NITROPHENYL)-3,5-PYRIDINEDICARBOXYLIC ACID

Philip M. Carabateas, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed June 12, 1972, Ser. No. 262,001
Int. Cl.² C07D 213/55
U.S. Cl. 260—295.5 R 1 Claim

1. 4-(3-Nitrophenyl)-3,5-pyridinedicarboxylic acid.

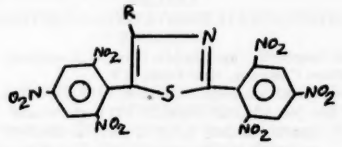
3,922,279

2,5-DIPICRYL THIAZOLES

Michael E. Sitzmann, Chevy Chase, Md., and Joseph C. Dacons, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1972, Ser. No. 298,090
Int. Cl.² C07D 275/02
U.S. Cl. 260—302 R 3 Claims

1. A thiazole of the formula



wherein R is selected from the group consisting of H and NO_2.

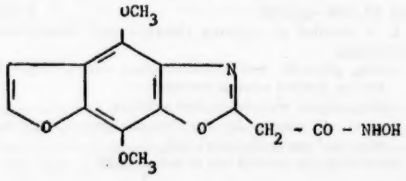
3,922,280

PHARMACOLOGICALLY ACTIVE 4,8-DIMETHOXY-FURO (3',2'-F)BENZOXAZOL-2-YL ACETHYDROXAMIC ACID

Claude P. Fauran, Paris; Jeannine A. Eberle, Chatou; Guy M. Raynaud, Paris, and Bernard M. Pourrias, Meudon La Foret, all of France, assignors to Delalande S.A., Courbevoie, France

Filed Feb. 14, 1974, Ser. No. 442,757
Claims priority, application France, Feb. 19, 1973, 73.05816
Int. Cl.² C07D 498/14
U.S. Cl. 260—307 D 1 Claim

1. 4,8-dimethoxy-furo (3',2'-f)benzoxazol-2-yl acethydroxamic acid having the formula:



3,922,281

PROCESS FOR THE PREPARATION OF 3-(O,O-DIETHYLDITHIOPHOSPHORYLMETHYL)-6-CHLORO-BENZOXAZOLONE

Michel Sauli, Paris, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed June 26, 1974, Ser. No. 483,421
Claims priority, application France, June 28, 1973, 73.23660
Int. Cl.² C07D *263/58*
U.S. Cl. 260—307 C 5 Claims

1. Process for the preparation of 3-(0,0-diethyldithiophosphorylmethyl)-6-chloro-benzoxazolone which comprises condensing an alkali metal or the ammonium salt of 0,0-diethyldithiophosphoric acid, formaldehyde and 6-chloro-benzoxazolone in a single step in the presence of methanesulphonic acid and at 0° to 25°C.

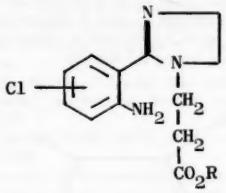
3,922,282

2-ARYL-2-IMIDAZOLINE-1-PROPIONIC ACIDS AND THEIR ESTERS

Harshavadan C. Shah, Secane, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 17, 1975, Ser. No. 541,904
Int. Cl.² C07D *49/34*
U.S. Cl. 260—309.6 7 Claims

1. A compound of the formula:



wherein R is hydrogen or alkyl of from 1 to 6 carbon atoms, and the pharmacologically acceptable addition salts thereof.

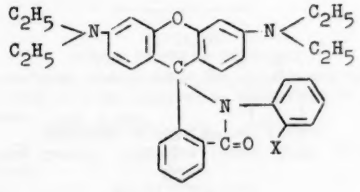
3,922,283

NEW FLUORAN COMPOUND

Masakichi Yahagi, Tokyo, and Shoichi Horiuchi, Fujimi, both of Japan, assignors to Shin Nisso Kako Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1973, Ser. No. 392,545
Claims priority, application Japan, Sept. 4, 1972, 47-87914
Int. Cl.² C07D *209/34*, *209/38*
U.S. Cl. 260—325 6 Claims

1. A compound of the general formula



wherein X represents a halogen atom.

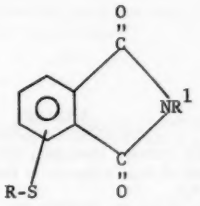
3,922,284

N-SUBSTITUTED AROMATIC THIOETHERPHTHALIMIDES

Darrell R. Heath, Pittsfield, Mass., and Frank J. Williams, III, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,469
Int. Cl.² C07D *209/48*, *221/14*
U.S. Cl. 260—326 S 7 Claims

1. A compound of the formula



, and

where R is a group selected from the class consisting of phenyl, tolyl, xylyl, naphthyl, hydroxyphenyl, chlorophenyl and aminophenyl and R^1 is a group selected from the class consisting of R radicals and $C_{(1-8)}$ alkyl radicals.

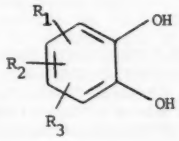
3,922,285

PROCESS FOR THE METHYLENATION OF CATECHOLS

Willy Leimgruber, Montclair, N.J., and Alexander E. Wick, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 128,572, March 26, 1971, Pat. No. 3,726,924. This application Dec. 6, 1972, Ser. No. 312,468
Int. Cl.² C07D *317/54*
U.S. Cl. 260—340.5 2 Claims

1. A process for the methylenation of catechols comprising the step of reacting a catechol of the formula



wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen C_1—C_7, lower alkyl and lower alkoxy with methylene chloride in the presence of a strong base selected from the group consisting of tris(dimethylamino) methane, tris(pyrrolidino)methane, tris(piperidino)methane, bis)dimethylamino)-t-butoxymethane and bis(dimethylamino)-methoxymethane.

3,922,286

PROCESS FOR THE PRODUCTION OF OPTICALLY ACTIVE DIHYDROCHRYSANTHEMOLACTONE

Hirosuke Yoshioka; Akio Higo, both of Ikeda; Hajime Hirai, Tokyo, and Nobushige Itaya, Ikeda, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 14, 1972, Ser. No. 234,660
Claims priority, application Japan, Mar. 23, 1971, 46-17019
Int. Cl.² C07D *311/94*
U.S. Cl. 260—343.2 8 Claims

1. A method for preparing optically active dihydrochrysanthemolactone, comprising the steps of optical resolution of (±)-dihydrochrysanthemolactone by adding as seed crystals

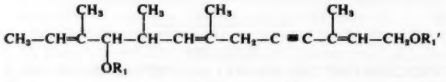
optically active dihydrochrysanthemolactone to a solution at a temperature of −30° to 60°C of an organic solvent selected from the group consisting of paraffinic hydrocarbon, aromatic hydrocarbon, monoterpene hydrocarbon, halogenated hydrocarbon, a polar solvent mixed with water and mixtures thereof which is saturated or supersaturated with (±)-dihydrochrysanthemolactone, and allowing to stand the resulting mixture for 5 to 50 hours at a temperature of −30° to 60°C to deposit the optically active dihydrochrysanthemolactone.

3,922,287
POLYENE COMPOUNDS

Beverly Ann Pawson, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 209,386, Dec. 17, 1973, Pat. No. 3,783,141. This application Aug. 22, 1973, Ser. No. 390,457
Int. Cl.² C07C *309/34*
U.S. Cl. 260—345.9 **5 Claims**

1. A compound of the formula:



wherein R_1 is lower alkyl, and R_1 ' is hydrogen, tetrahydropyranyl, benzyl, benzhydryl, alpha-lower alkoxy-lower alkyl or trityl.

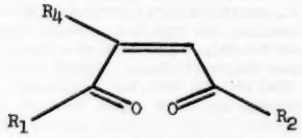
3,922,288
PROCESSES FOR PRODUCING 3-THIA FURANS AND 3-URAN THIOLS

William J. Evers, Atlantic Highlands; Howard R. Heinsohn, Jr., Hazlet, and Bernard J. Mayers, Cliffwood Beach, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

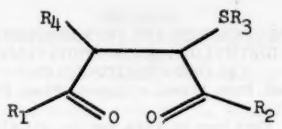
Continuation-in-part of Ser. No. 386,450, Aug. 7, 1973, abandoned. This application June 11, 1974, Ser. No. 478,368
Int. Cl.² C07D *307/64*
U.S. Cl. 260—347.2 **13 Claims**

1. A process for producing a 3-thia furan compound comprising the steps of:

i. Intimately admixing at a temperature of from 0°C to reflux temperature and autogenous pressure a 2-ene-1,4-dione having the structure:



with a thiol having the formula R_3SH thereby providing a substituted or unsubstituted 2-thia substituted-1,4-dione having the structure:



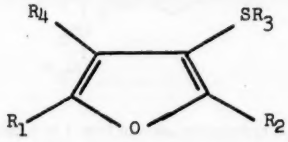
wherein R_3 is selected from the group consisting of alkyl, alkanoyl and aroyl; wherein R_2 is lower alkyl; and wherein R_1 and R_4 are the same or different and are selected from the group consisting of hydrogen and lower alkyl; wherein when R_1 is hydrogen, the reaction (i) is carried out in the presence of an organic base selected from the group consisting of secondary amines and tertiary amines; and wherein when R_1 is lower alkyl, the reaction (i) is carried out in the presence or absence of said organic base; and

ii. Cyclizing said 2-thia substituted-1,4-dione at a temperature of from 25°C up to reflux temperature and autogenous pressure, with a cyclizing agent comprising:

a. A first compound selected from the group consisting of sulfuric acid, hydrochloric acid, zinc chloride, boron trifluoride, boron trifluoride etherates, aluminum trichloride, para toluene sulfonic acid and boron trichloride; and

b. A second compound selected from the group consisting of acetic anhydride, propionic anhydride and isopropenyl acetate;

the weight ratio of said first compound to said second compound being from 0.001 up to 0.05, and the weight ratio of said second compound to said 2-thiasubstituted-1,4-dione being from 4:1 up to 5:1, to form a substituted or unsubstituted 3-thia furan having the formula:

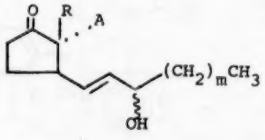


3,922,289
TRANS-PROSTAGLANDIN-LIKE COMPOUNDS AND METHODS

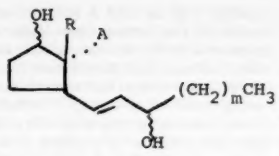
John W. Patterson, Mountain View, and John H. Fried, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 23, 1973, Ser. No. 335,432
Int. Cl.² C07D *307/34*
U.S. Cl. 260—347.3 **21 Claims**

1. The (dl) mixtures, d-isomers, and l-isomers of the compounds of the formulas



(I)



or

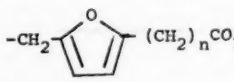
(II)

wherein

R is —H or CH_3;

m is a whole integer from zero through eight;

A is



in which

R^1 is —H or an alkyl of from one through ten carbon atoms,

n is a whole integer from zero through four,

and the wavy line ( ) represents the α or β configuration or mixtures thereof; and

pharmaceutically acceptable salts of the compounds of Formulas (I) and (II) when R^1 is —H.

3,922,290

PROCESS FOR THE PREPARATION OF ANTHRAQUINONE

Raymond Janin, Irigny, and Leon Krumenacker, Serezin du Rhone, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 8, 1974, Ser. No. 468,138

Claims priority, application France, May 11, 1973, 73.17154

Int. Cl.² C07C *49/68*; C09B *1/06*

U.S. Cl. 260—385 **9 Claims**

1. In a process for the preparation of anthraquinone which comprises oxidising anthracene, in the liquid phase, by means of oxygen or an oxygen-containing gas, in the presence of cupric chloride, and in an organic diluent, the improvement wherein the organic diluent is a glycol of the general formula:

$$HO + R-O \frac{}{n} H \quad (I)$$

in which R is a linear or branched saturated divalent aliphatic radical containing up to 10 carbon toms and *n* is an integer from 1 to 3.

3,922,291

22-DEHYDRO-HOMOCHOLENIC ACID

Collin H. Schroeder; Richard J. Lechnir, and Philip H. Derse, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 14, 1974, Ser. No. 442,458

Int. Cl.² C07J *00/00*

U.S. Cl. 260—397.1 **2 Claims**

1. 22-dehydrohomocholenic acid.

3,922,292

NOVEL HAPTENE STEROIDS

Vesperto Torelli, Maisons-Alfort, and Andre Pierdet, Noisy-le-Sec, both of France, assignors to Roussel-UCLAF, Paris, France

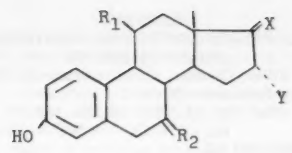
Filed June 17, 1974, Ser. No. 479,889

Claims priority, application France, June 18, 1973, 73.22114

Int. Cl.² C07J *1/00*

U.S. Cl. 260—397.1 **9 Claims**

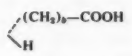
1. A steroid of the formula



wherein X is selected from the group consisting of =O and

Y is selected from the group consisting of hydrogen and —OH and when R_1 is $-(CH_2)_a-COOH$ in which a is equal to $2n + 3$ and *n* is 0, 1 or 2, R_2 is

and when R_1 is hydrogen, R_2 is selected from the group consisting of



and $=N-Z-(CH_2)_c-COOH$, *b* is a number from 3 to 18, *c* is a number from 1 to 8 and Z is selected from the group consisting of —O— and —NHCONH—.

3,922,293

PROSTAGLANDIN F-TYPE 9-MONOACYLATES

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 214,477, Dec. 30, 1971, Pat. No. 3,853,963. This application Jan. 25, 1974, Ser. No. 436,493. The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.² C07C *177/00*

U.S. Cl. 260—410 **2 Claims**

1. $PGF_{2\alpha}$, 9-octanoate.

3,922,294

PROCESS FOR THE MANUFACTURE OF ISOPROPYL ESTERS BY THE REACTION OF PROPYLENE WITH CARBOXYLIC ACIDS

Ernst Ingo Leupold, Hofheim, Taunus, and Hans-Jürgen Arpe, Fischbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 7, 1974, Ser. No. 440,580

Claims priority, application Germany, Nov. 24, 1973, 2358625; Feb. 10, 1973, 2306586

Int. Cl.² C07C *67/04*

U.S. Cl. 260—410.9 R **5 Claims**

1. A process for the manufacture of isopropyl esters by reacting propylene with carboxylic acids, in trickling phase, which comprises the step of passing gaseous propylene and an aliphatic, cycloaliphatic, or aromatic carboxylic acid having up to 20 carbon atoms either in liquid form or in the form of a solution in an inert solvent continuously in parallel flow over an acid ion exchanger of the sulfonic acid type at a temperature in the range of from 40° to 170°C.

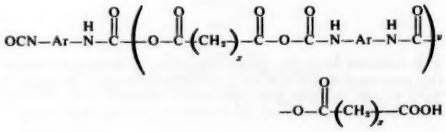
3,922,295

ISOCYANATE-CONTAINING OLIGOMERIC POLYANHYDRIDES

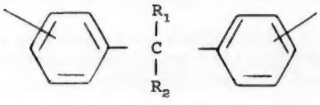
James N. Tilley, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 25, 1974, Ser. No. 508,990
Int. Cl.² C07C *119/048*
U.S. Cl. 260—453 AR **13 Claims**

1. An oligomeric poly N-carboxylic anhydride having the structure



wherein Ar represents an arylene radical selected from the group consisting of phenylene, tolylene, xylylene, naphthylene, diphenylylene, and compounds having the formula



wherein R_1 and R_2 each represent a moiety selected from the class consisting of hydrogen and lower-alkyl having from one to four carbon atoms inclusive, x represents an integer from 1 to 10, and y represents a number having an average value from 0 to 4 inclusive.

3,922,296

NOVEL PROCESS FOR THE PREPARATION OF CYCLOPENTANE-1, 2-DIONES AND INTERMEDIATES THEREFOR

Thurman Chestler McFearin, Jr., Odessa, Tex., assignor to El Paso Products Company, El Paso, Tex.

Filed Dec. 19, 1973, Ser. No. 426,021
Int. Cl.² C07C *45/00, 67/30*
U.S. Cl. 260—468 K **25 Claims**

1. A process for the preparation of 3-alkyl-cyclopentane-1,2-diones which comprises condensing a dialkyl ester of glutaric acid with a dialkyl ester of oxalic acid, in a polar aprotic solvent having a dipole moment of at least 1.5, in the presence of an alkali metal alkoxide and at temperatures sufficient to effect condensation of said esters to form a first reaction mixture containing 3,5-dicarboalkoxy-cyclopentane-1,2-dione dialkali metal salt, contacting said first reaction mixture with at least a stoichiometric amount of an alkyl halide of 1–5 carbon atoms under alkylating conditions to produce a second reaction mixture containing a 2-alkoxy-3,5-dicarboalkoxy-5-alkyl-cyclopent-2-ene-1-one, removing said aprotic solvent from said second reaction mixture and hydrolyzing said 2-alkoxy-3,5-dicarboalkoxy-5-alkyl-cyclopent-2-ene-1-one by heating with a 10 to 30 percent aqueous mineral acid solution to produce a 3-alkyl cyclopentane-1,2-dione.

3,922,297

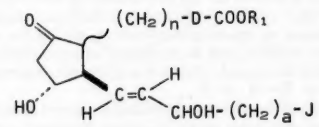
PROSTAGLANDIN E¹, F¹, AND A¹ ANALOGS

John E. Pike, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

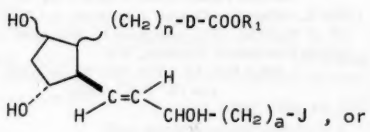
Division of Ser. No. 324,026, Jan. 16, 1973, Pat. No. 3,847,966, which is a continuation-in-part of Ser. No. 168,455, Aug. 2, 1971, abandoned, which is a division of Ser. No. 748,158, July 29, 1968, abandoned. This application Apr. 8, 1974, Ser. No. 458,931
Int. Cl.² C07C *61/38, 69/74*
U.S. Cl. 260—468 D **9 Claims**

1. An optically active compound of the absolute configuration of natural PGE_1 or a racemic compound with the formula:

I

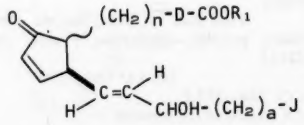


II



, or

III



wherein *n* is 1 to 6 and *a* is zero to 4; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein J is isobutyl or tert-butyl; wherein D is ethylene substituted by one or 2 fluoro; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration, and pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,922,298

3-OXA PROSTAGLANDIN B-TYPE COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

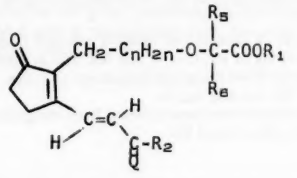
Continuation of Ser. No. 332,079, Feb. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 47,169, June 17, 1970, abandoned. This application Apr. 17, 1974, Ser. No. 461,603

Claims priority, application United Kingdom, July 29, 1969, 38073/69

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—468 D **38 Claims**

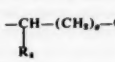
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_nH_{2n} is alkylene of one to 10 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, between —CH_2— and —O—; wherein Q is

or

wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the *β*-position with 3 chloro; wherein R_2 is



wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; and wherein R_5 and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,922,299

VINYLIC SUBSTITUTION REACTIONS

Richard F. Heck, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Filed Mar. 5, 1974, Ser. No. 448,246

Int. Cl.² C07C *69/76*

U.S. Cl. 260—476 R **2 Claims**

1. The process of producing vinylically or allylically substituted olefinic compounds or tautomeric or reduced forms thereof which comprises contacting an olefinic compound having at least one hydrogen on a vinylic position with a catalytic amount an organometallic compound of general formula $RPd(X)(PR'_3)_2$ or a combination of reagents which produces this complex under the reaction conditions and an organic halide (RX) and a basic tertiary amine, wherein R is an aryl, a vinylic, an ethynyl, heterocyclic or a benzyl group or a substituted derivative thereof, X is Br, Cl, or I and R′ is an aryl group.

3,922,300

PROCESS FOR PREPARING AN UNSATURATED ESTER

Takeru Onoda; Akira Yamura, both of Yokohoma; Akihisa Ohno, Kawasaki; Junzo Haji, Tokyo; Jun Toriya, Kurashiki; Masato Sata, Kurashiki, and Naoatsu Ishizaki, Kurashiki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

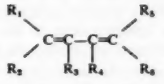
Filed May 22, 1974, Ser. No. 472,158

Claims priority, application Japan, May 22, 1973, 48-56986

Int. Cl.² C07C *67/05*

U.S. Cl. 260—497 A **25 Claims**

1. A process for the production of unsaturated diesters, which comprises reacting a conjugated diene, having the formula:



wherein R_1, R_2, R_3, R_4, R_5 and R_6 may be the same or different and each represents hydrogen or an alkyl group having 1 to 6 carbon atoms, a carboxylic acid selected from the group consisting of aliphatic, aromatic and alicyclic carboxylic acids, and molecular oxygen in the presence of a solid catalyst consisting essentially of palladium and at least one component selected from the group consisting of antimony, bismuth, tellurium and selenium supported on activated carbon, which catalyst is prepared by reducing said catalyst with hydrogen or a reducing organic compound selected from the group consisting of gaseous methanol, carbon monoxide, formaldehyde, formic acid and ethylene and solutions of hydrazine and formaldehyde, treating said reduced catalyst with oxygen or and oxygen-containing gas at a temperature above 200°C and then reducing the oxidized catalyst with hydrogen or a reducing organic compound selected from the groups consisting of gaseous methanol, carbon monoxide, formaldehyde, formic acid and ethylene and solutions of hydrazine and formaldehyde at a temperature of at least 200°C.

3,922,301

SULPHONIC ACID DERIVATIVES OF PROSTAGLANDINS

Masaki Hayashi; Seiji Kori, both of Takatsuki, and Yoichi Iguchi, Amagasaki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

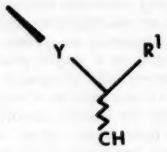
Filed June 14, 1974, Ser. No. 479,341

Claims priority, application United Kingdom, June 19, 1973, 29070/73

Int. Cl.³ C07C *143/00*

U.S. Cl. 260—503 **9 Claims**

1. A compound of the general formula:



wherein A represents a grouping of the formula:

X represents cis-vinylene or ethylene, Y represents trans-vinylene or ethylene, R^1 represents a straight- or branched-chain alkyl group containing from 5 to 7 carbon atoms, and indicates attachment of the hydroxy radical to the carbon atom in the alpha or beta configuration or the corresponding cyclodextrin clathrates and non-toxic salts thereof.

3,922,302

15-ETHYNYL-11-DEOXY PGE

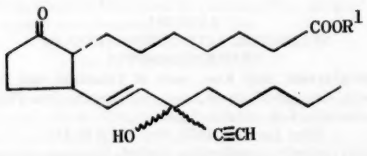
Donald P. Strike, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed July 26, 1973, Ser. No. 383,007

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—514 D **2 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen, alkyl of from 1 to about 6 carbon atoms, alkali metal, or a pharmacologically acceptable cation derived from ammonia or a basic amine.

3,922,303

PROCESS FOR THE PRODUCTION OF TERTIARY AMINES HAVING HIGHER ALKYL GROUP

Kikuo Takehara; Shigeaki Okajima, both of Kyoto; Saburo Komori, and Toshio Agawa, both of Osaka, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Japan

Continuation-in-part of Ser. No. 116,275, Feb. 17, 1971, abandoned. This application Dec. 10, 1973, Ser. No. 423,515

Int. Cl.² C07C *91/16, 83/00, 91/02*

U.S. Cl. 260—570.5 R **10 Claims**

1. A process for the production of a tertiary amine having a higher alkyl group or higher alkyl groups which comprises carrying out a substitution reaction between a primary or secondary alcohol selected from the group consisting of

1) $CH_3(CH_2)_nCH_2OH$	wherein n=6 to 28
2) $CH_3(CH_2)_xCH{=}CH(CH_2)_yCH_2OH$	wherein x+y=4 to 26
3) $CH_3(CH_2)_x{-}CH{-}(CH_2)_yCH_3$ (OH)	wherein x+y=5 to 27
4) $CH_3(CH_2)_x{-}$ ($CH_2)_yOH$ and	wherein x=6 to 20, y=1 to 20
5) $A{-}(OC_2H_4)_mOH$	wherein A is a residue of an active hydrogen group-containing compound and m=1 to 50

and a starting tertiary amine, said starting tertiary amine being a trialkylamine having three alkyl groups, each alkyl group having 1 to 30 carbon atoms, at least one of said alkyl groups being a lower alkyl group having 1 to 5 carbon atoms, in an atmosphere consisting essentially of nitrogen and in the presence of a catalyst selected from:

a. Fe, Co, Ni and Ru,

b. Alloys consisting of a combination of two or more members selected from the group consisting of Fe, Co, Ni and Ru,

c. Alloys of at least one member selected from the group consisting of Fe, Co, Ni and Ru, and at least one metal selected from the group consisting of Cr, Mn, W, Mo, Cu, Cd, Zn, Au and Ag, or

d. Mixtures of members selected from the group consisting of Fe, Co, Ni and Ru.

3,922,304

PROCESS FOR PREPARING P-PHENYLENEDIAMINE

Ralph C. Schreyer, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 26, 1974, Ser. No. 445,948

Int. Cl.² C07C *87/50, 87/58*

U.S. Cl. 260—578 **10 Claims**

1. A process for preparing p-phenylenediamine comprising

a. reacting aniline with carbon monoxide at a pressure of at least about 300 atmospheres in the presence of an alkali metal alkoxide.

b. reacting the resulting formanilide with a nitrating acid; and

c. converting the nitro group and the N-formyl group of the resulting p-nitroformanilide to amino groups by a catalytic hydrogenation reaction and an hydrolysis, or alcoholysis, reaction.

3,922,305
CHEMICAL COMPOUNDS

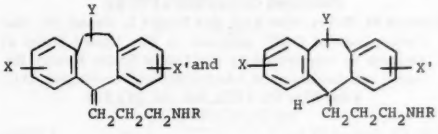
Edward L. Engelhardt, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 215,770, Aug. 9, 1962, abandoned, which is a continuation-in-part of Ser. No. 140,223, Sept. 25, 1961, abandoned, which is a continuation-in-part of Ser. No. 120,835, May 24, 1961, abandoned. This application July 25, 1963, Ser. No. 297,710

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.8 TC 6 Claims

1. A compound selected from the group consisting of



and acid addition salts thereof wherein R is selected from the group consisting of hydrogen, alkyl having up to 6 carbon atoms, benzyl, or cycloalkyl having up to 8 carbon atoms; Y is selected from the group consisting of hydrogen, chloro, bromo; and X and X′ are selected from the group consisting of hydrogen, chloro, or bromo.

3,922,306
PROCESS FOR REFINING AMINES

Masaaki Takaku, and Shiro Kawahito, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1974, Ser. No. 435,086

Claims priority, application Japan, Jan. 24, 1973, 48-10116

Int. Cl.² C07C *85/06, 85/16*

U.S. Cl. 260—583 N 9 Claims

1. A method for refining aliphatic hydrocarbon amines having at least one alkyl group of 9 to 22 carbon atoms attached to the amino nitrogen, said amines being derived from polymerized ethylene and containing impurities which form coloring substances when the amines are converted to amine salts, which comprises the steps of: reacting said amine with

A. from 0.01 to 5 percent by weight, based on said amine, of a borohydride substance selected from the group consisting of alkali metal borohydrides, amine borohydrides, quaternary ammonium borohydrides and mixtures thereof, and

B. up to 50 percent by weight, based on said aliphatic amine, of an alkali,

and recovering from the reaction mixture a refined aliphatic amine which is not apt to color during salt-forming reactions.

3,922,307
PROCESS FOR PREPARING CYCLOHEXANEDIONES-(1,3)

Werner H. Muller, Kelkheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

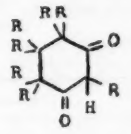
Filed Sept. 13, 1973, Ser. No. 396,983

Claims priority, application Germany, Sept. 15, 1972, 2245271

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 C 11 Claims

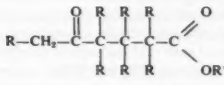
1. Process for preparing cyclohexanediones-(1,3) having the formula



wherein

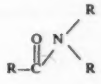
the individual radicals R may be identical or different and represent — each — a hydrogen atom, an alkyl group or an aryl group

by reaction of a γ-acyl-carboxylic acid ester having the formula



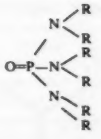
wherein R has the aforesaid meaning and R′ is an alkyl group or an aryl group, with a strongly basic condensation agent in the presence of a solvent consisting essentially of a member of one of the following groups.

a. carboxylic acid amides having the formula



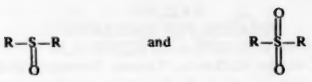
wherein the individual radicals R may be identical or different and represent — each — a hydrogen atom, an alkyl group or an aryl group

b. phosphoric acid amides having the formula



wherein the individual radicals R may be identical or different and represent — each — an alkyl group or an aryl group,

c. sulfoxides and sulfones having the formula



wherein the individual radicals R may be identical or different and represent — each — an alkyl or an aryl group, and

d. macrocyclic polyethers,

said solvent being removed from the reaction product upon completion of the cyclization reaction and thereafter acidifying the reaction product to obtain said cyclohexanediones.

3,922,308

HYDROLYZED DIELS-ALDER ADDUCTS OF OCIMENOL

John M. Derfer, and James O. Bledsoe, Jr., both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 879,578, Nov. 24, 1969, Pat. No. 3,758,590. This application Mar. 14, 1973, Ser. No. 340,946

Int. Cl.² C07C *47/46*

U.S. Cl. 260—598 **2 Claims**

1. A processs for synthesizing an olfactory product being the hydrolyzed, hydrogenated Diels-Alder adduct of ocimenol reacted with a dienophile aldehyde selected from acrolein, methacrolein, and crotonaldehyde, comprising:

refluxing ocimenol with said dienophile aldehyde at temperatures between about 0°C. to 150°C. to form an unsaturated Diels-Alder adduct of ocimenol and said dienophile aldehyde;

hydrogenating said unsaturated adduct to form a saturated adduct of ocimenol and said dienophile aldehyde;

hydrolyzing said saturated adduct with an acid solution at temperatures between about 25°C. to 100°C. to form a hydrolyzed, hydrogenated Diels-Alder adduct.

3,922,309

PROCESSES FOR PRODUCING ALKENALS AND INTERMEDIATES THEREFOR

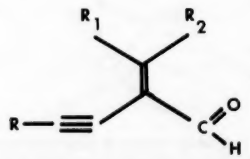
William L. Schreiber, Ocean, and Alan O. Pittet, Atlantic Highlands, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed July 30, 1973, Ser. No. 383,579

Int. Cl.² C07C *47/02*

U.S. Cl. 260—601 R **4 Claims**

1. A 2-alkylidene-3-alkynal having the formula:



wherein R is lower alkyl, and one of R_1 and R_2 is lower alkyl and the other is hydrogen.

3,922,310

FLAVOR COMPOSITIONS AND PROCESSES

Paul Dietrich, Chene-Bourg-Geneva; Alan F. Thomas, Bernex-Geneva, both of Switzerland; William P. Clinton, Monsey, and Thomas H. Parliment, Valley Cottage, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 297,103, Oct. 12, 1972. This application Sept. 20, 1974, Ser. No. 507,824

Int. Cl.² C07C *47/20*

U.S. Cl. 260—601 R **1 Claim**

1. 2,5,5-trimethyl-hepta-2,6-dienal.

3,922,311

FLUORODINITROETHYL DIFLUOROFORMAL AND PROCESS OF MANUFACTURE

Howard M. Peters, Palo Alto, and Robert L. Simon, Jr., San Carlos, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 10, 1972, Ser. No. 251,878

Int. Cl.² C07C *43/30*

U.S. Cl. 260—615 A **1 Claim**

1. The compound bis(2-fluoro-2,2-dinitroethyl) difluoroformal.

3,922,312

POLYHYDROPHENANTHRENE DIOLS

Philip E. Shaw, Winter Haven, Fla.; Sol J. Daum, Albany, and Robert L. Clarke, Bethlehem, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 269,402, July 6, 1972, Pat. No. 3,830,843, which is a division of Ser. No. 879,920, Nov. 25, 1969, Pat. No. 3,755,361, which is a continuation-in-part of Ser. No. 585,762, Oct. 11, 1966, Pat. No. 3,592,838. This application Aug. 31, 1973, Ser. No. 393,623

Int. Cl.² C07C *35/42*

U.S. Cl. 260—617.5 **3 Claims**

1. 1,2,3,4,4a,4b,5,6,7,8,8a,9,10,10a-Tetradecahydrophenanthrene bearing in both the 2- and 7-positions a hydroxy group, and wherein the 4b-position is unsubstituted or bears a lower-alkyl group.

3,922,313

PROCESS FOR THE PRODUCTION OF 3-CHLOROPROPANOL-1

Hans Wagner, and Klaus Udluft, both of Constance, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation of Ser. No. 235,061, March 15, 1972, abandoned. This application Mar. 8, 1974, Ser. No. 449,389

Claims priority, application Germany, Mar. 30, 1971, 2115327

Int. Cl.² C07C *31/34*

U.S. Cl. 260—633 **12 Claims**

1. A process for the production of 3-chloropropanol-1 comprising:

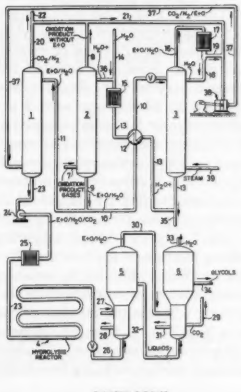
1. reacting acrolein in an inert solvent with hydrogen chloride at −30° to +50°C., there being used 0.82 to 0.96 mole of hydrogen chloride per mole of acrolein, to form chloropropionaldehyde; and

2. then reducing the chloropropionaldehyde with an alkali boranate at 0° to 50°C., there being employed 0.20 to 1.00 mole of the boranate per mole of chloropropionaldehyde.

3,922,314
PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL

Gioacchino Cocuzza, Catania; Italo Montoro, Como, and Bendetto Calcagno, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Nov. 29, 1973, Ser. No. 420,350
Int. Cl.² C07C 29/10
U.S. Cl. 260—635 E 4 Claims



E=OXIRANE OXIDE

2. A process according to claim 1, characterized in that the hydrolysis of ethylene oxide is carried out at a temperature of from about 100° to 150°C, at a pressure of from about 4 to 10 kg/cm², and with times of from about 20 to 60 minutes.

3,922,315
PROCESS FOR THE PREPARATION OF NITROAROMATIC COMPOUNDS

Maurice M. Mitchell, Jr., Wallingford, and Edward S. J. Tomezsko, Media, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 26, 1973, Ser. No. 409,981
Int. Cl.² C07C 79/10
U.S. Cl. 260—645 8 Claims

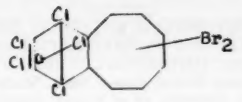
1. A method for the mononitration of aromatic compounds selected from the group consisting of benzene, alkylated benzenes and naphthalene which comprises contacting said aromatic compound in the liquid phase in the presence of hydrogen and a tris-triarylphosphine-halorhodium(I) catalyst with an excess of nitrogen dioxide at a temperature in the range of from 25°C. to 165°C.

3,922,316
PREPARATION OF A BROMINATED FIRE RETARDING AGENT

John Versnel, Plainsboro, and Lionel T. Wolford, Freehold, both of N.J., assignors to Cities Service Oil Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 390,668, Aug. 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 130,817, April 2, 1971, abandoned. This application Aug. 8, 1974, Ser. No. 495,599
Int. Cl.² C07C 17/04, 23/20
U.S. Cl. 260—648 C 4 Claims

1. In a process for preparing a brominated fire retarding agent having the hexachlorocyclopentadiene structure



comprising, in sequence, the steps of

a. reacting hexachlorocyclopentadiene with at least a stoichiometric amount of cyclooctadiene,

b. extracting, from the mixture of mono-adducts and di-adducts formed in step (a), the mono-adduct with a selective liquid organic solvent having a dielectric constant of less than about 30 and being chemically non-reactive toward the adducts,

c. brominating the extracted mono-adduct with at least a stoichiometric amount of bromine, and

d. separating the brominated adduct formed in step (c),

the improvement consisting of

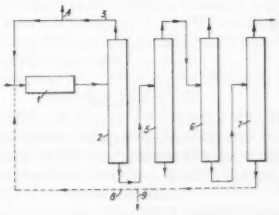
A. performing the bromination step using the solvent system employed in extraction step (b) and

B. separating the brominated adduct from the solvent system and recycling the separated solvent for use in extraction step (b).

3,922,317
PRODUCTION OF PROPENYLNORBORNENE

Pannalal Sohanlal Jhawar, Stockton-on-Lees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 19, 1974, Ser. No. 498,855
Claims priority, application United Kingdom, Aug. 29, 1973, 40574/73
Int. Cl.² C07C 13/28
U.S. Cl. 260—668 PX 10 Claims



1. A process for the production of at least 90% pure 2-(1-propenyl)norbornene-5 which comprises:

a. condensing cyclopentadiene and piperylene,

b. distilling the condensation product to obtain a distillate fraction comprising unreacted cyclopentadiene and/or piperylene and a residue fraction comprising 2-(1-propenyl)norbornene-5,

c. distilling the residue fraction from (b) to produce a distillate fraction containing 2-(1-propenyl)-norbornene-5 and a residue fraction comprising C_{15} hydrocarbons,

d. distilling the distillate fraction from stage (c) to produce a residue fraction comprising 2-(1-propenyl)norbornene-5 and a distillate fraction comprising piperylene dimers,

e, distilling a residue fraction from stage (d) to produce a distillate fraction comprising at least 90% 2-(1-propenyl)norbornene-5 and a residue fraction comprising dicyclopentadiene and/or methyl-tetrahydroindenes.

3,922,318

PROCESS FOR PURIFYING BUTADIENE AND ISOPRENE BY SELECTIVE HYDROGENATION OF THE ACETYLENIC IMPURITIES CONTAINED THEREIN

Germain Martino, Poissy; Robert Stern, Marly Le Roi, and Jean Cosyns, Nanterre, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 12, 1974, Ser. No. 450,460

Claims priority, application France, Mar. 16, 1973, 73.09656

Int. Cl.² C07C 5/16, 7/00

U.S. Cl. 260—681.5 R 17 Claims

1. In a process for selectively hydrogenating acetylenic hydrocarbon impurities contained in a diolefin selected from the group consisting of butadiene, isoprene and mixtures thereof, wherein said diolefin in liquid phase is reacted with hydrogen at a temperature lower than 80° C in the presence of a hydrogenation catalyst containing at least one metal selected from the group consisting of iron, molybdenum and cobalt, the improvement comprising conducting said hydrogenating in the additional presence of cyclopentadiene in an amount of 0.1 to 10 times by weight the amount of said diolefin.

3,922,319

ISOPARAFFIN-OLEFIN ALKYLATION UTILIZING FLUOROSULFONIC ACID AND SULFURIC ACID CATALYST

James W. Brockington, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,595

Int. Cl.² C07C 3/54

U.S. Cl. 260—683.63 10 Claims

1. In a liquid alkylation process for alkylating C_4—C_6 isoparaffins with C_3—C_5 mono-olefins to form alkylate hydrocarbon products; the improvement which comprises:

contacting, in an alkylation zone, isoparaffin and olefin reactants with a catalyst comprising $HFSO_3$ and H_2SO_4 in a weight ratio of from about 0.11/1, to about 0.32/1, and having a titratable acidity of from about 16.5 to about 21 meq/gm.

3,922,320

IMPACT-RESISTANT VINYL HALIDE RESIN COMPOSITIONS CONTAINING A STYRENE-BUTADIENE-ALKYL METHACRYLATE POLYMER AND A STYRENE-ACRYLONITRILE COPOLYMER

Fred E. Love, Denver, Colo., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 21, 1973, Ser. No. 362,311

Int. Cl.² C08L 51/00, 53/00

U.S. Cl. 260—376 R 5 Claims

1. An impact-resistant resinous composition consisting essentially of

a. 70 to 90 percent by weight of a vinyl halide resin selected from the group consisting of polyvinyl halides and copolymers that contain at least 70 percent of vinyl halide units and up to 30 percent of copolymer units;

b. 5 to 15 percent by weight of an elastomer that is the product obtained by grafting an alkyl methacrylate and styrene onto polybutadiene and that contains 10 to 40 percent of styrene units, 15 to 30 percent of alkyl methacrylate units, and 40 to 65 percent of butadiene units; and

c. 5 to 15 percent by weight of a thermoplastic resin that is a styrene-acrylonitrile copolymer that contains from 50 to 90 percent of styrene, methylstyrene, ethylstyrene, monochlorostyrene, or methoxystyrene units and 10 to 50 percent by weight of acrylonitrile, methacrylonitrile, ethacrylonitrile, or chloroacrylonitrile units.

3,922,321

METHYL METHACRYLATE RESINS AND GRAFTED ACRYLATE-BUTADIENE-STYRENE POLYMERS

Haruhiko Yusa, and Yukihiro Ochiai, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Japan

Filed June 17, 1974, Ser. No. 480,312

Claims priority, application Japan, June 16, 1973, 48-67961

Int. Cl. C08f 15/18, 19/08, 19/02, 19/10, 19/16, 19/20, 37/18

U.S. Cl. 260—876 R 8 Claims

1. A resin composition of high transparency, inpact strength, and weather resistance comprising a mixture of from 5 to 40 percent of a graft copolymer (I) and from 60 to 95 percent of a polymer (II), selected from the group consisting of a homopolymer of polymethyl methacrylate and copolymers of at least 50 percent by weight of methyl methacrylate and a copolymerizable monomer selected from the group consisting of styrene, acrylonitrile, alkyl acrylates and an alkyl methacrylate having an alkyl group with 2 or more carbon atoms, the graft copolymer (I) being obtained by adding from 25 to 150 parts of a monomer mixture (B) comprising from 50 to 100 percents of an alkyl methacrylate, from 0 to 50 percent of a vinyl monomer and a cross-linking monomer, present in amounts of 2 percent or less by weight of the constituent monomers, copolymerizable therewith, to a latex containing 100 parts of a rubber polymer (A) and subjecting to polymerization the resulting mixture of the mixture (B) and the latex, the rubber latex (A) being obtained by emulsion polymerization of a monomer mixture comprising from 50 to 90 percent of an alkyl acrylate, wherein the number of carbon atoms in the alkyl group is from 2 to 12, from 5 to 30 percent of styrene and from 1 to 20 percent of butadiene, all quantities expressed above in percentages and parts being by weight.

3,922,322

PROCESS FOR DRY POLYMERIZATION OF OLEFINS

Dormenval Roger, Carry-le-Rouet; Havas Laszlo, and Mangin Pierre, both of Martiques, all of France, assignors to Naphtachimie, Paris, France

Filed Nov. 15, 1973, Ser. No. 416,045

Claims priority, application France, Nov. 17, 1972, 72.40810

Int. Cl.² C08L 23/26; C08F 255/02

U.S. Cl. 260—878 B 12 Claims

1. A process of producing polymers having a molecular weight generally above 50,000, by polymerization of olefins having the general formula CH_2=CHR in which R is selected from the group consisting of a hydrogen atom and an alkyl radical having up to 8 carbon atoms, in the presence of a prepolymer containing a catalyst formed of a catalytically active solid compound of a transition metal of sub-groups IVa, Va or VIa of the periodic table of elements, and at least one co-catalyst formed of an organo-metallic compound of a metal of groups II or III of the periodic table in which the prepolymer is prepared by polymerization of one or more olefins in an inert liquid and a solid compound of a transition metal of sub-groups IVa, Va and VIa of the periodic table of elements and a co-catalyst, comprising:

preserving the catalyst containing prepolymer solid in a hydrogen atmosphere;

separately introducing into a reaction vessel the olefin or olefins to be polymerized and the catalyst containing prepolymer solid;

circulating upwardly in the reaction vessel containing polymer in the course of being formed, a stream of a gaseous mixture containing the olefin or the olefins to be polymerized, and hydrogen, in which the polymer in the reaction vessel is fluidized by the gaseous mixture containing hydrogen and the olefin or olefins to be polymerized;

recycling to the reaction vessel the gases issuing therefrom; and

removing at least a part of the polymer contained in the reaction vessel.

3,922,323
CYCLIC PHOSPHONIC ACID ESTERS

Johannes Reese, Wiesbaden-Biebrich; Kurt Kraft, Wiesbaden-Dotzheim, and Edgar Dick, Walsdorf near Idstein, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

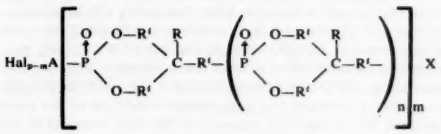
Continuation of Ser. No. 57,758, July 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 610,462, Jan. 20, 1967, abandoned. This application June 28, 1973, Ser. No. 374,534

Claims priority, application Germany, Jan. 22, 1966, 3800212; Feb. 5, 1966, 3813012; Feb. 12, 1966, 3820339

Int. Cl.² C07F 9/40

U.S. Cl. 260—927 R **15 Claims**

1. An at least bicyclic compound free from hydroxyl and carboxyl groups and of the formula



wherein

m is equal to *p* and greater than 1 when *n* is zero;

each of *m* and *p* is an integer from 1 to 4, *m* being at most equal to *p*;

n is an integer from and including zero to below about 80, (m+n) being at least 2;

X is a halogen with an atomic weight of at least 35;

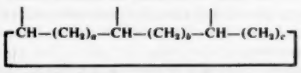
Hal is a halogen with an atomic weight of at least 35 and which is capable of reaction with trialkyl phosphites in forming monoalkyl phosphonic esters;

A is a monovalent or polyvalent radical having from 1 to 19 carbon atoms, having free positions at the same or at different carbon atoms and which is: a) a hydrocarbon radical; b) a radical (a) in which each of from one to three pairs adjacent of carbon atoms is, independently, interrupted by an oxa- or an aza-atom; or c) a halogen-substituted radical (a) or (b) in which each halogen is not or is only with difficulty susceptible to a Michaelis-Arbusow reaction;

R is a member having from 1 to 18 carbon atoms and selected from the group consisting of d) a hydrocarbon radical; e) a hydrocarbon radical substituted by one group —OZ, wherein Z is an acyclic hydrocarbon group having at most one ethylenic bond and at most 4 carbon atoms; f) a hydrocarbon radical substituted by one group —OOC—Y, wherein Y is a saturated or unsaturated acyclic radical with at most 18 carbon atoms; and g) one of components (d) to (f) having an aromatic nucleus and containing halogen;

each R^1 is, independently, a member selected from the group consisting of h) methylene and i) substituted methylene, any substituent thereon being a member selected from the group consisting of aa) a hydrocarbon group and bb) a halogenated hydrocarbon group, one or any two substituents of a sole methylene group (h) containing less than 8 carbon atoms; and

$(-R^1)_3C-R$ is, alternatively a member selected from the group consisting of R^4 of the formula



in which the sum of integers *a*, *b* and *c* is two or three, at most one of *a*, *b* and *c* being zero; and substituted R^4, any substituent of substituted R^4 having at most 30 carbon atoms, replacing a hydrogen of R^4 and being a member selected from the group consisting of (aa), (bb) and cc) an alkoxylated hydrocarbon group, any 2 substituents of a sole methylene group containing less than 8 carbon atoms.

3,922,324
N-[O-ARYL-THIONOALKANEPHOSPHONYL]IMINO-FORMIC ACID ALKYL ESTERS

Hellmut Hoffmann, Wuppertal-Elberfeld; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

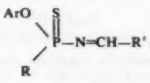
Division of Ser. No. 431,833, Jan. 9, 1974. This application July 16, 1974, Ser. No. 489,795

Claims priority, application Germany, Jan. 27, 1973, 2304062

Int. Cl.² C07F 9/24; A01N 9/36

U.S. Cl. 260—950 **6 Claims**

1. An O-aryl-thionoalkanephosphonic acid ester-imide derivative of the formula



in which

R is lower alkyl,

R′ is lower alkoxy, and

Ar is optionally chlorine-substituted phenyl.

3,922,325
PREPARATION OF TRIALKYL TRITHIOPHOSPHITES

John E. Anderson, Phillips, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 21, 1973, Ser. No. 372,241

Int. Cl.² C07F 9/202

U.S. Cl. 260—972 **9 Claims**

1. A process for the preparation of trialkyl trithiophosphites by the reaction of a phosphorus trihalide with an alkyl mercaptan under reaction conditions wherein the improvement comprises employing in said reaction about 50 to 500 ppm of water by volume based on the amount of said alkyl mercaptan charged to said reaction.

3,922,326
APPARATUS FOR TREATING LIQUIDS AND GASES

Fujio Yoshida; Akiharu Yamada; Shogo Tanigawa, and Takesi Yokoyama, all of Tamano, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,439

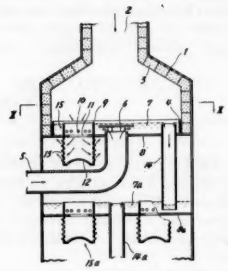
Claims priority, application Japan, Nov. 29, 1973, 48-134194

Int. Cl.² B01D 3/14, 47/00; C10J 1/08; F02M 29/04

U.S. Cl. 261—113 **3 Claims**

1. Apparatus for treating liquids and gases comprising a column having a gas inlet at the top thereof and trays provided at spaced intervals, each tray being provided with a downcomer for maintaining a depth of liquid thereon and overflowing the liquid to the lower tray, openings communicating with the space below the tray, gas-liquid contacting structures surrounding said opening, each gas-liquid contacting structure

comprising a perforated weir plate provided above the tray and a contacting cylinder having a bottom and a plurality of



apertures at the side wall provided below the tray, and means for feeding the liquid onto the uppermost tray.

3,922,327

METHOD OF MANUFACTURE OF OPTICAL ELEMENTS

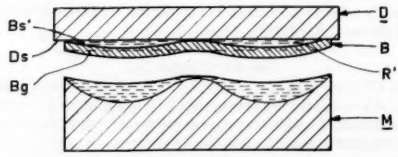
Harry Howden, Salfords, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,761

Claims priority, application United Kingdom, Nov. 22, 1972, 53952/72The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.² B29D *11/00*

U.S. Cl. 264—1 **9 Claims**



1. A method of manufacturing an optical element from a blank of light-transmissive material, characterized in supporting the blank with one surface facing and in contact or in proximity with a mould surface that has a profile which, in a direction normal to said one surface, is a magnification of a required optical profile for the optical element, filling the region between said surfaces with an adhesive resin material that shrinks on curing by a predetermined amount, causing the resin material to cure with it adhered to both said surfaces so that the blank is deformed, securing the other, outer, surface of the deformed blank to a supporting surface, releasing said one surface of the blank from the cured resin material, with the blank held deformed by said supporting surface, optically working flat said one surface of the blank, and releasing the worked blank from said supporting surface, the magnification factor of the mould surface profile being an inverse function of the percentage shrinkage of said resin material, but not being sufficiently large to cause deformation of the blank beyond its elastic limit.

3,922,328

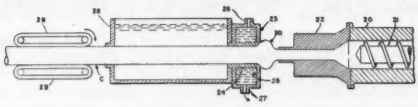
METHOD FOR MAKING STRUCTURAL FOAM PROFILES

Keith G. Johnson, Pittsburgh, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Filed Feb. 18, 1972, Ser. No. 227,575

Int. Cl. B79d *77/00*

U.S. Cl. 264—46.1 **12 Claims**



1. A method for making continuous lengths of resin profiles from thermoplastic resin material containing a heat sensitive foaming or expanding agent, comprising delivering the resin material under pressure through and out of a confining passage into an unconfined zone of lower pressure, the temperature and pressure of the resin material in the confining passage providing a softened but unexpanded condition of the resin material therein and the pressure of the resin material in the unconfined zone providing for partial expansion of the resin material by the action of the foaming agent, delivering the expanded resin material from the unconfined zone into a shaping die passage having cross sectional dimensions the same as those of the profile being made and in which said cross sectional dimensions are uniform throughout a substantial length of the die passage, solidifying the surface layer of the previously softened and now expanded resin material while it is in the shaping die passage by cooling the surface layer of the resin material in the shaping die passage to a temperature below the softening point, and applying axial tension to the extruded material in the die passage by gripping the resultant shaped profile downstream of the die passage and pulling on the profile to advance the resin material from said unconfined zone into and through the die passage in sliding surface contact with the die passage, the rate of delivery of the resin material out of the confining passage into the unconfined zone being sufficient to maintain a mass of partially expanded resin material in said zone which mass is of larger cross sectional area than the die passage, and the rate of pulling of the resin material from the unconfined zone into the die passage being sufficient to advance the resin material into the die passage before the resin material is fully expanded and thereby provide for solidifying of the surface layer while in contact with the surface of the shaping die passage under radial pressure developed by foaming of the foaming agent in the interior portion of the material and thus effect formation of a profile having the cross sectional dimensions of the die passage and having a dense skin and expanded core.

3,922,329

METHODS OF MAKING NETWORK STRUCTURES

Charles W. Kim, Wilmington; Chia-Seng Liu, and Richard MacDuff, both of Newark, all of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jan. 16, 1973, Ser. No. 324,028

Int. Cl.² B29H *7/18*

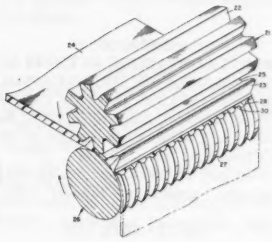
U.S. Cl. 264—147 **29 Claims**

1. A method of making a network structure comprising:

forming on one side of a sheet of thermoplastic polymer material a plurality of parallel continuous main ribs interconnected by webs of reduced thickness extending in a first direction;

forming on the other side of said sheet a plurality of parallel rows of discontinuous tie ribs extending in a second direction different than said first direction, said tie ribs being formed opposite the webs interconnecting said main ribs

and having no substantial portion thereof crossing over a main rib; and



drawing the sheet in at least one direction to separate the main ribs into continuous main filaments and to separate the tie ribs into tie filaments to form a uniform network structure having main filaments thereof being substantially uniformly and continuously oriented.

3,922,330
SEPARATION AND PURIFICATION OF PLATINUM GROUP METALS AND GOLD

Willem Hubert Pittie, Roodepoort; Gerhardus Overbeek, Florida, and Kingsley Ferguson Doig, Johannesburg, all of South Africa, assignors to Swarsab Mining, Exploration & Development Company Limited, South Africa

Filed Aug. 2, 1973, Ser. No. 384,826
Claims priority, application South Africa, 72/5490
Int. Cl.² C01G *55/00, 7/00*
U.S. Cl. 423—22 **14 Claims**

1. In a method for separating palladium from a mixture of PGMs (platinum group metals), which contains palladium and at least one other PGM, by precipitating the palladium with dimethylglyoxime from a solution of the mixture, the improvement wherein (a) the solution is that of ammine complexes (formed in solution) of the metals and (b) said metals are in a reduced state; with the proviso that said solution is buffered at a pH of about 4.0 when platinum values are contained therein.

3,922,331
PREPARATION OF MICROPOROUS RARE-EARTH OXYHALIDES

David J. MacDonald, Reno, and Judith A. Eisele, Verdi, both of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 14, 1973, Ser. No. 415,908
Int. Cl.² C01F *17/00*
U.S. Cl. 423—263 **5 Claims**

1. A process for preparing a microporous oxychloride of a rare-earth metal selected from the group consisting of Ce, Pr, Nd, Gd, Dy and Er comprising the steps:

a. forming a solution of a hydrated chloride of said rare-earth metal in a polar solvent;
b. mixing said solution with an amount of an alkylene oxide 25 to 50 percent in excess of the stoichiometric amount necessary to form the oxychloride;
c. allowing the mixture to react for a time sufficient to form a solid or semi-solid product;
d. separating the resulting solid or semic-solid product from the reaction mixture; and
e. drying said product in substantial absence of oxygen and at a temperature of about 400° to 700°C for about 1 to 16 hours whereby a microporous oxychloride having a surface area of at least 20 square meters per gram is obtained.

3,922,332
MANUFACTURE OF FREE-FLOWING INORGANIC AMMONIUM OR POTASSIUM SALTS

Walter Schenk, Bad Durkheim, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 6, 1973, Ser. No. 338,552
Claims priority, application Germany, Mar. 7, 1972, 2210798
Int. Cl. C01c *1/24;* **C01d** *3/26, 9/20*
U.S. Cl. 423—268 **14 Claims**

1. A process for the manufacture of a free-flowing inorganic ammonium or potassium salt, said process comprising adding to said inorganic salt as an anti-agglomerant a mixture of at least 4 half-esters of sulfuric acid each with a different isomeric nonanol in an amount of from 0.00005 to 0.02% by weight of said mixture of half-esters with reference to the weight of said salt.

3,922,333
PROCESS FOR PREPARING MULLITE POWDER AND FABRICATION OF STRUCTURAL BODIES THEREFROM

Khodabakhsh S. Mazdiyasni, Xenia, and Leanne M. Brown, Brookville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 366,887, June 4, 1973, abandoned. This application Oct. 23, 1974, Ser. No. 517,339
Int. Cl.² C01B *33/26*
U.S. Cl. 423—327 **12 Claims**

1. A process for preparing mullite which comprises the steps of:

a. adding a mixture of aluminum tris isopropoxide and a silicon alkoxide in a mol ratio of 3 to 1 to an alcohol, the silicon alkoxide being selected from the group consisting of those having the formula $Si(OR)_4$, where R is methyl, ethyl, isopropyl or n-butyl and the alcohol being selected from the group consisting of those having the formula ROH, the alcohol selected having the same R group as the selected silicon alkoxide;
b. refluxing the resulting solution for from about 8 to 24 hours;
c. adding the solution to a dilute solution of a weak base or mineral acid, thereby forming hydroxyaluminosilicate, the solution of the weak base containing from about 0.25 to 5 milliliters of a saturated solution of the weak base per mol of water and the solution of the mineral acid containing about 2 to 5 drops of acid per mol of water;
d. washing the hydroxyaluminosilicate with isopropyl alcohol; and
e. drying the washed hydroxyaluminosilicate under a vacuum, thereby converting it to mullite.

3,922,334
FOAM CARBONIZATION AND RESULTING FOAM STRUCTURES

Ronald W. Marek, Tonawanda, and William T. Yudichak, Niagara Falls, both of N.Y., assignors to Airco, Inc., Montvale, N.J.

Filed Jan. 31, 1973, Ser. No. 328,230
Int. Cl.² B05G *3/02;* **C01B** *31/02*
U.S. Cl. 423—445 **9 Claims**

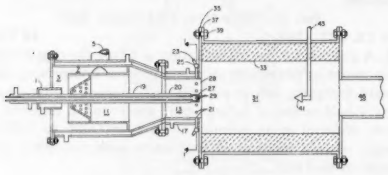
1. A method for preparing a fully reticulated carbonized foam wherein the webs defining the walls of individual pores are substantially solid, comprising in sequence the steps of: impregnating a fully reticulated polyurethane foam with a solution comprising a thermosetting phenolic resin in a tetrahydrofuran solvent, said solution being absorbed into and becoming an integral part of the structure of said foam; heat-curing the impregnated foam to rigidize said foam; and baking said cured foam to evaporate the polyurethane and carbonize the residual impregnant.

3,922,335

PROCESS FOR PRODUCING CARBON BLACK

Merrill E. Jordan, Walpole, and Allan C. Morgan, Sudbury, both of Mass., assignors to Cabot Corporation, Boston, Mass.

Filed Feb. 25, 1974, Ser. No. 445,569
Int. Cl.² C09C 1/48, 1/50
U.S. Cl. 423—450 9 Claims



1. A process for producing carbon black which comprises: establishing an enclosed stream of hot combustion gases having a linear velocity sufficient to atomize and to disperse liquid carbon forming feedstock; injecting liquid feedstock in the form of a plurality of individual coherent streams substantially transversely into the combustion gas stream from the exterior periphery thereof; injecting liquid feedstock in the form of a plurality of individual coherent streams outwardly and substantially transversely into the combustion gas stream from at least one location in the interior thereof; each of the coherent streams of feedstock being caused to penetrate the combustion gas stream to a depth sufficient to avoid significant contact of the feedstock with apparatus prior to mixing thereof with the hot combustion gas stream and forming solid carbon particles; quenching the reaction mixture and collecting carbon black product.

3,922,336

IODINE PERCHLORATES

Karl O. Christe, Calabasas, and Carl J. Schack, Chatsworth, both of Calif., assignors to The United states of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 363,708, May 24, 1973, Pat. No. 3,873,677. This application Mar. 18, 1975, Ser. No. 559,601
Int. Cl.² C01B 7/24, 7/02, 11/18
U.S. Cl. 423—466 3 Claims

1. A method of preparing anhydrous iodine trisperchlorate, $I(OClO_3)_3$, comprising:

contacting in an inert environment chlorine perchlorate and iodine at a temperature in the range of −78°C to 0°C for 70 or more hours, provided that at least 6 moles of chlorine perchlorate are used per mole of iodine, I_2, to form said iodine trisperchlorate and subsequently recovering the iodine trisperchlorate.

3,922,337

HYDROGEN

John Stewart Campbell; Patrick Craven, and Phineas Davies, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 60,615, Aug. 3, 1970, abandoned. This application Dec. 19, 1972, Ser. No. 316,566
Claims priority, application United Kingdom, July 22, 1970, 35513/70
Int. Cl.² C01B 1/02, 1/03
U.S. Cl. 423—656 6 Claims

1. In a process for producing hydrogen which comprises contacting carbon monoxide with steam over a copper-containing/low temperature shift catalyst which includes copper and zinc oxide, the improvement whereby poisoning of the shift catalyst by halogen present in the reactants is avoided, said improvement comprising first passing the carbon monoxide and steam over an inorganic oxidic solid material which is more basic than zinc oxide before passing the reactants over the shift catalyst.

3,922,338

TABLETS CONTAINING IN THEIR MASS CONTROLLED-RELEASE MICRO-CAPSULES AND PROCESS FOR MANUFACTURE OF SAID TABLETS

Yvette Fr. M. J. Estevenel; Maurice H. Thely, both of Paris, and Wladimir A. Coulon, Claye-Souilly, all of France, assignors to Choay S.A., Paris, France

Filed July 10, 1974, Ser. No. 487,042
Claims priority, application France, July 12, 1973, 73.25531
Int. Cl.² A61K 9/24
U.S. Cl. 424—21 7 Claims

1. Compressed layered tablets containing, in their mass, controlled-release microcapsules, comprising the association of a plurality of superposed layers, of which the medial layer essentially comprises microcapsules containing an active substance, while the exterior layers, which have a microcrystalline cellulose, starch, alginate, or polyoxy ethylene glycol tablet excipient composition, constitute means of protecting the microcapsules of the medial layer, particularly against the shock of compression, said tablet excipient composition being in the form of granules having the same grain size as said microcapsules.

3,922,339

SUSTAINED RELEASE MEDICANT

Jeff L. Shear, Creve Coeur, Mo., assignor to KV Pharmaceutical Company, St. Louis, Mo.

Filed June 20, 1974, Ser. No. 481,056
Int. Cl.² A61K 9/22
U.S. Cl. 424—22 16 Claims

1. A process of preparing a sustained release pharmaceutical preparation of a medicant which comprises (1) blending a medicant with desired inert materials; (2) wetting the blend with sufficient liquid material so as to act as a binder on compacting; (3) compacting the wetted blend by extruding to form a spaghetti-like material; (4) drying, breaking and screening the extruded material to the desired particle size; (5) spraying the particles with a solution of a film-forming material; (6) dusting the sprayed particles with a powder and drying to form a seal on the particles; and (7) coating the sealed particles with a solution of an excipient so as to form an enteric-soluble coating on the sealed particle.

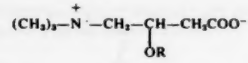
3,922,340

PHARMACEUTICAL COMPOSITIONS FOR TREATING LUNG DISEASES

Hideyuki Miwa, Kyoto, Japan, assignor to Otsuka Pharmaceutical Company Limited, Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,273
Claims priority, application Japan, Dec. 7, 1972, 47-122839
Int. Cl.² A61L 9/04; A61K 31/22, 31/23, 31/14
U.S. Cl. 424—45 2 Claims

1. A method for treating a lung disease causing an abnormal decrease in the oxygen concentration in the blood which comprises administering an effective amount of at least one compound taken from the class consisting of l-carnitine derivatives and salts thereof with pharmaceutically acceptable acids by inhalation to a patient, said l-carnitine derivative having the formula of



wherein R is a hydrogen atom or a fatty acid residue having 4 to 24 carbon atoms.

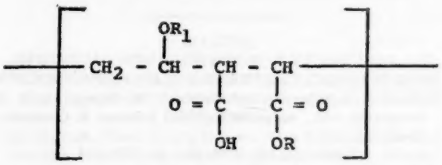
3,922,341
AEROSOL HAIR SPRAYS CONTAINING ETHYL OR BUTYL MONOESTER OF COPOLYMER OF VINYL MONOMER AND MALEIC ACID

Jean-Louis Abegg, Paris, and Annie Madrange, Saint-Germain-en-Laye, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Mar. 28, 1974, Ser. No. 455,809
Claims priority, application Luxemburg, Mar. 30, 1973, 67330
Int. Cl.² A61K 7/11
U.S. Cl. 424—47 **10 Claims**

1. A lacquer composition for use as a hair spray comprising a mixture of

a. 0.5–4 weight percent of a copolymer containing a repeating unit of the formula:



where:

R is ethyl or butyl,

R_1 is alkyl having 1–4 carbon atoms, and 20–35% of the free carboxylic acid functions of the copolymer are neutralized with an organic base, said copolymer having a molecular weight between about 15,000 and 60,000;

b. an alcoholic phase corresponding to about 20–45% by weight of the total weight of the composition; and as a propellant a mixture consisting essentially of

c. trichlorofluoromethane and

d. nitrous oxide; wherein the composition is confined under an internal pressure between 3 and 8 kg/cm².

3,922,342
POISON IVY AND POISON OAK TREATMENT UTILIZING HYDROPHILIC ANION EXCHANGE MATERIAL

William B. Rathbun, St. Paul, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed May 7, 1973, Ser. No. 358,100
Int. Cl.² A61K 31/715, 31/74
U.S. Cl. 424—79 **6 Claims**

1. A method of treating allergic dermatitis caused by contact with plants of the Anacardiacea family, which method comprises:

A. applying a composition consisting essentially of an aqueous suspension of a water-imbibing swellable non-resinous hydrophilic anion exchange material which is of gel consistency capable of adhering to the skin on the affected skin areas,

B. maintaining said suspension in contact with the skin for at least about 10 minutes without substantial drying of the suspension,

C. removing the anionic exchange material,

D. rinsing the treated area with water, and

E. drying the skin.

3,922,343
ANTIBIOTIC XK-49-1-B-2 AND PROCESS FOR PRODUCTION THEREOF USING STREPTOSPORANGIUM VLOLACEOCHROMOGENES

Takashi Nara, Tokyo; Seigo Takasawa, Kawasaki; Ryo Okachi; Isao Kawamoto, both of Machida; Masahiro Kohagura, and Itaru Takahashi, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1973, Ser. No. 393,829
Claims priority, application Japan, Sept. 7, 1972, 47-89085
Int. Cl.² A61K 35/00
U.S. Cl. 424—116 **5 Claims**

1. The antibiotic XK-49-1-B-2, the hydrochloride of which has the following characteristics:

a. elementary analysis: C: 32.13%, N: 4.20%, H: 6.34% and Cu: 3.4%,

b. ultraviolet absorption spectrum (water): essentially as shown in FIG. 1 with absorption maxima at 244 mμ and 293 mμ,

c. infrared absorption spectrum: essentially as shown in FIG. 2 with major peaks at the following wavelengths (cm^{-1}): 3400, 3200(Sh), 2950, 1720, 1655, 1635, 1580-1550, 1520-1510(Sh), 1460, 1250, 1050, 1010, 980(Sh),

d. Ratio of the absorbancy at 244 mμ to that at 293 mμ in the ultraviolet absorption (water): 1.34,

e. color reaction: positive in Sakaguchi, Pauli and Ehrlich tests: negative in ninhydrin test,

f. paper chromatography: Rf values as shown in Table 4,

g. silica gel thin layer chromatography: Rf values as shown in Table 5.

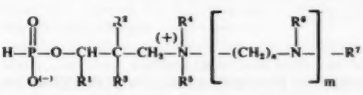
4. A process for the production of the antibiotic XK-49-1-B-2, which comprises; culturing *Streptosporangium violaceochromogenes* ATCC 21807 in a nutrient medium at a temperature of from 25°C to 40°C and at about neutral pH; accumulating XK-49-1-B-2 in said medium; and recovering the antibiotic XK-49-1-B-2 therefrom.

3,922,344
DISINFECTANT COMPOSITIONS USEFUL AGAINST PROTOZOAN OOCYSTS

Wolfgang Raether, Dreieichenhain; Helmut Diery, Kelkheim, Taunus, and Ulrich Cuntze, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 11, 1974, Ser. No. 460,132
Claims priority, application Germany, Apr. 14, 1973, 2319045
Int. Cl.² A01N 9/36
U.S. Cl. 424—211 **9 Claims**

1. A disinfectant composition useful against protozoan oocysts comprising a mixture of (a) a compound of the formula



in which R^1 is hydrogen or methyl, R^2, R^3, R^4, R^5 and R^6 may be the same or different and are hydrogen or alkyl of 1 to 4 carbon atoms, R^7 is alkyl of 8 to 18 carbon atoms or alkenyl of 8 to 18 carbon atoms, *n* is 2 or 3 and *m* is zero or 1 to 4; and (b) a chlorinated organic solvent selected from the group consisting of methylene chloride, chloroform, carbon tetrachloride, chlorobenzene, dichlorobenzene, trichlorobenzene, tetrachlorobenzene, ethylene chloride, trichloroethane, tetrachloroethane, tetrachloroethylene and mixtures thereof; said mixture being in the ratio of 10 to 90 percent by weight of (a) to 90 to 10 percent by weight of (b).

3,922,345
PYRIMIDINONES AND HYDROXY PYRIMIDINES

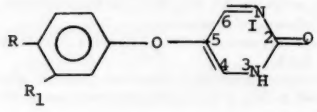
Christopher A. Lipinski, Groton; John G. Stam, Lyme, both of Conn.; Gerald G. DeAngelis, Rolling Hills Estates, Calif., and Hans-Jurgen E. Hess, Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 194,006, Oct. 29, 1971. This application Feb. 11, 1974, Ser. No. 440,975

Int. Cl.² A61K *31/525*; **A01N** *9/22*

U.S. Cl. 424—251 **5 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable acid addition, non-toxic metal, ammonium and substituted ammonium salts thereof wherein:

R and R_1 are each hydrogen or methyl with the proviso that at least one of R and R_1 be hydrogen.

2. The method of treating peptic ulcer which comprises administering to a subject afflicted therewith a daily dose of a compound of claim **1** equivalent to about .60 to 21 mg of said compound per kg. body weight.

3,922,346
BENZOCYCLOHEPTALSOQUINOLINE DERIVATIVES III IN PRODUCING CNS DEPRESSANT EFFECTS

Francois T. Bruderlein, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada.

Division of Ser. No. 242,839, April 10, 1972, Pat. No. 3,852,452, which is a continuation-in-part of Ser. No. 97,481, Dec. 21, 1970, and a continuation-in-part of Ser. No. 10,306, Feb. 10, 1970, Pat. No. 3,657,250. This application Sept. 30, 1974, Ser. No. 510,275The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl. A61k *31/47*

U.S. Cl. 424—258 **10 Claims**

1. A pharmaceutical composition having central nervous system activity containing a carrier and an amount up to abot 500 milligrams effective to produce a central nervous system depresant effect in a mammal without deleterious side-effects of a compound selected from the group consisting of 5-t-butyl-1,4,5,6,6a,10,11,15b-octahydro-3H-benzo[6,7]cyclohepta[1,2,3-de]pyrido[2,1-a]isoquinolin-5-ol; 5-isopropyl-1,4,5,6,6a,10,11,15b-octahydro-3H-benzo[6,7]cyclohepta[1,2,3-de]pyrido[2,1-a]isoquinolin-5-ol; 5-cyclohexyl-1,4,5,6,6a,10,11,15b-octahydro-3H-benzo[6,7]cyclohepta[1,2,3-de]pyrido[2,1-a]isoquinolin-5-ol, and 5-phenyl-1,4,5,6,6a,10,11,15b-octahydro-3H-benzo[6,7]cyclohepta[1,2,3,-de]pyrido[2,1-a]isoquinolin-5-ol.

3,922,347
METHOD OF INHIBITING PROLACTIN SECRETION WITH 8-ACYLAMINOERGOLENES

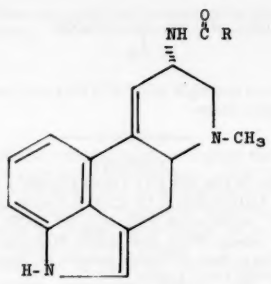
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 19, 1974, Ser. No. 534,500

Int. Cl.² A61K *31/48*

U.S. Cl. 424—261 **7 Claims**

1. A method of inhibiting prolactin secretion comprising administering to a subject suffering from conditions of undesired excessive prolactin secretion and in need of treatment an amount effective to inhibit excess prolactin secretion of the compound of the formula



wherein

R is hydrogen, C_1-C_4 alkyl, phenyl, phenyl-substituted C_1-C_4 alkyl, 5-(L-2-pyrrolidonyl), or CH_2COOR_2,

wherein:

R_2 is C_1-C_4 alkyl; and the non-toxic pharmaceuticallyacceptable acid addition salt thereof.

3,922,348
3′,4′-DIHYDROXY-2-(ISOPROPYLAMINO)ACETOPHENONE INTRAOCULAR PRESSURE LOWERING PROCESS

Richard J. Seidehamel, and Kendrick W. Dungan, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Sept. 16, 1974, Ser. No. 506,634

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **8 Claims**

1. A process of lowering intraocular pressure in the mammalian eye which comprises topical application thereto of an effective ophthalmologically acceptable amount for lowering intraocular pressure of a compound selected from the group consisting of 3′,4′-dihydroxy-2-(isopropylamino)acetophenone and an ophthalmologically acceptable acid addition salt thereof.

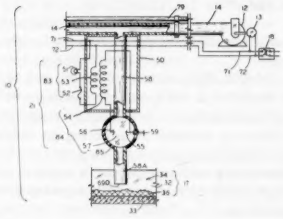
3,922,349
CATTLE FEED TREATED WITH AIR EXPOSED TO ULTRAVIOLET AND HIGH VOLTAGE

Charles William Osborne, deceased, late of Pampa, Tex., and Weymar Zack Osborne, executor, 1315 Williston St., Pampa, Tex. 79065

Continuation of Ser. No. 381,682, July 23, 1973, abandoned, which is a continuation of Ser. No. 168,759, Aug. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 73,099, Sept. 17, 1970, abandoned. This application Oct. 16, 1974, Ser. No. 515,258

Int. Cl.² A23L *3/28*

U.S. Cl. 426—2 **5 Claims**



2. Process as in claim **1** wherein said treatment of said cattle

feed composition by said resultant gas continues while said cattle feed on said feed composition.

3,922,350

PROCESS FOR PREPARING ACIDIFIED BREAD DOUGH

William G. Dockendorf, Stamford, and Harold Gross, Norwalk, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,473
Int. Cl.[2] A21D *2/14, 10/00*
U.S. Cl. 426—25 9 Claims

1. A process for preparing acidified bread dough comprising incorporating into a dough suitable for producing yeast leavened sour dough bread an effective amount of fumaric acid coated with an edible material to acidify the dough without substantially adversely affecting the leavening activity of the yeast, said coating having a melting point temperature higher than normal proofing temperatures but within the range of normal baking temperatures, the amount of coated fumaric acid being sufficient to provide a titratable acidity of from about 4 to about 5 in the bread when the dough is baked.

3,922,351

ENHANCEMENT OF FLAVOR WITH 2,5,5-TRIMETHYL-EPTA-2,6-DIENAL AND LOWER ALKYL ACETALS THEREOF

Paul Dietrich, Chene-Bourg-Geneva; Alan F. Thomas, Bernex-Geneva, both of Switzerland; William P. Clinton, Monsey, and Thomas H. Parliment, Valley Cottage, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 12, 1972, Ser. No. 297,103
Int. Cl. A23l *1/26*
U.S. Cl. 426—534 10 Claims

1. A process for enhancing the flavor of foodstuffs comprising adding thereto a compound selected from the group consisting of 2,5,5-trimethyl-hepta-2,6-dienal, lower alkyl acetals of 2,5,5-trimethyl-hepta-2,6-dienal and mixtures thereof in an amount effective to impart a woody flavor to the foodstuff.

3,922,352

JUICY SAUSAGE ANALOG AND PROCESS

Robert T. Tewey, Irvington, and Sudhakar P. Shanbhag, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 1, 1974, Ser. No. 457,008
Int. Cl.[2] A23J *3/00;* A23L *1/04*
U.S. Cl. 426—89 15 Claims

1. An improved process for preparing a juicy sausage analog, having a heterogeneous texture comprised of at least three distinct phases which comprises:

a. providing particles of a solidified fat;
b. providing particles of a chewy proteinaceous component comprising coagulated vegetable protein, and from about 20% to about 70% water, by weight;
c. providing as a precursor of a continuous gel phase, a uniform blend comprising water and heat coagulable protein and flavor;
d. mixing the fat particles, the chewy proteinaceous component particles, and the continuous gel phase precursor sufficiently to blend the ingredients and then coarsely chopping the resulting blend to obtain a substantially uniformly heterogeneous distribution of the particulate material within the continuous gel phase precursor; and
e. forming the resulting coarsely comminuted blend into a substantially cohesive sausage analog by coagulating the continuous gel phase precursor.

3,922,353

SHELF STABLE, HIGH MOISTURE, FILLED FOOD PRODUCT

John W. Bernotavicz, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Mar. 25, 1974, Ser. No. 454,213
Int. Cl.[2] A23G *3/00*
U.S. Cl. 426—94 27 Claims

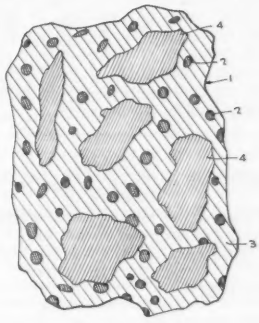
1. A centerfilled food product comprising a shelf stable, high moisture, meat containing filling having a major portion thereof enclosed by a cooked expanded cereal, said meat containing filling having a moisture content of at least about 50 percent by weight and having a water activity, A_w, of at least about 0.90, said filling comprising greater than 50 percent by weight cooked proteinaceous meaty material; from about 1 percent to about 35 percent by weight gelatinized starchy filler material with the total amount of cooked proteinaceous meaty material plus starchy filler material comprising greater than about 85 percent by weight of the filling; from about 1.7 percent to about 3.8 percent by weight edible, non-toxic acid sufficient to cause the filling to have a pH of from about 3.9 to about 5.5; and an effective amount of antimycotic.

3,922,354

PRODUCTION OF ARTIFICIAL SPICE PARTICLES

John F. Galluzzi, Boonton; Albert V. Saldarini, Nutley, and Thomas E. Murray, Rockaway Township, all of N.J., assignors to Norda Incorporated, New York, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,500
Int. Cl.[2] A23L *1/22*
U.S. Cl. 426—96 38 Claims



1. A process for preparing an improved particulate free-flowing flavoring composition having controlled flavor release characteristics wherein the flavoring agents are incorporated in a matrix comprising:

a. forming a mixture of partially gelatinized cereal solids in water, said water being in an amount sufficient to form a viscous difficulty flowable mash,
b. heating said mixture with agitation to a temperature of from about 65° to about 100°C until gelation takes place and a water content of from about 10 to about 20 per cent by weight is achieved,
c. cooling said mixture to a temperature of from about 40° to about 60°C,
d. dispersing at least one flavoring agent substantially throughout the cooled mixture while at a temperature of from about 40° to about 60°C,
e. cooling said resulting mixture until hardening occurs, and
f. grinding said hardened mixture to desired free-flowing particle size.

3,922,355
METHOD OF PREPARING COLORED MAMMARY GLAND TISSUE

Lindsay Lawrence Kotthoff, Lavington, Australia, assignor to Uncle Ben's of Australia Pty. Ltd., Wodonga, Australia

Filed Aug. 20, 1973, Ser. No. 389,720
Claims priority, application Australia, Aug. 23, 1972, 187/72
Int. Cl.² A23L *1/31*
U.S. Cl. 426—250 **7 Claims**

1. A method of preparing a red or pink coloured meat product suitable for use as food for animals from yellow or creamed colored mammary gland tissue which comprises the steps of:

injecting into said tissue an aqueous solution containing a red or pink colouring agent;

and continuing said injection until substantially uniform dispersion of said solution throughout said tissue is achieved and the tissue has the appearance of red or pink meat.

3,922,356
SULFITE CATALYZED ALUMINUM TANNAGE OF COLLAGEN CASING

Mauj A. Cohly, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

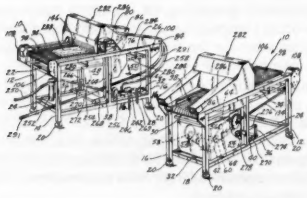
Filed Apr. 18, 1974, Ser. No. 462,015
Int. Cl.² A23L *1/31*
U.S. Cl. 426—277 **5 Claims**

1. In a process for producing a tubular collagen sausage casing which comprises the steps of extruding a slurry of finely divided collagen in water for forming a tube, coagulating the extruded tube in a coagulating bath containing a coagulating salt, tanning the coagulated tube in a tanning bath containing an aluminum tanning agent, and drying the aluminum tanned tube, the improvement for catalyzing the rate of tanning of said collagen tube by the aluminum in said aluminum tanning agent which comprises employing a sulfito-aluminum complex, containing a proportion of sulfite sufficient to satisfy one-sixth to one-third equivalents sulfite based on the aluminum, as said aluminum tanning agent.

3,922,357
METHOD FOR INJECTING FLUIDS INTO MEAT PRODUCTS

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Apr. 16, 1973, Ser. No. 351,541
Int. Cl.² A22C *17/00*
U.S. Cl. 426—281 **5 Claims**



1. The method of injecting fluid into a meat product, comprising,

providing a fluid injector needle means comprising a plurality of fluid injector needles,

intermittently moving a meat product adjacent to and past the fluid injector needle means,

penetrating the needles of said fluid injector means into said meat product between the periods of intermittent movement of said meat product,

coordinating the increments of movement of said meat product with the effective width of said fluid injector needle means past which said meat product moves so that the effective penetration area of said meat product initially penetrated by said fluid injector needle means will at least partially overlap the effective penetration area of said meat product penetrated by said fluid injector needle means after the next successive movement of said meat product,

each movement of said meat product being of a sufficient increment so that after said next successive movement of said meat product, the points of penetration of said needles in said overlapping penetration areas will be offset from the points of penetration of said needles during the next preceding penetration cycle so that said meat product will not be penetrated at the same point by any needles in said overlapping penetration areas of said meat product.

3,922,358
TREATMENT OF RAW MEAT

Michael John Follett, Fleet, England, assignor to J. Sainsbury Limited, London, England

Filed Sept. 18, 1973, Ser. No. 398,320
Claims priority, application United Kingdom, Oct. 5, 1972, 45987/72
Int. Cl.² A23B *4/00*
U.S. Cl. 426—316 **9 Claims**

1. A process for treating unfrozen raw meat cuts comprising subjecting freshly cut meat, wrapped in a container permeable to oxygen gas, to a gas mixture containing O_2 gas under pressure greater than atmospheric pressure for 2 to 24 hours at a temperature between the freezing point of the meat and the temperature at which the meat is adversely affected by increased temperature, the time-pressure combination being sufficient for the meat to retain its bright red color for at least 2 days, and

maintaining the so-oxygenated unfrozen raw meat cuts at a temperature above freezing.

3,922,359
METHODS OF PRODUCING PROTEIN MATERIALS

Kazumoto Hashizume, Chiba, and Tokuji Watanabe, Tokyo, both of Japan, assignors to Director of National Food Research Inst., Japan

Filed Mar. 28, 1973, Ser. No. 345,753
Claims priority, application Japan, Apr. 1, 1972, 47-32158
Int. Cl.² A23J *3/00*
U.S. Cl. 426—574 **6 Claims**

1. A method of producing solid protein material with a spongy texture, which comprises adding an edible divalent salt to a solution of soybean protein in such an amount that the solution becomes turbid white with protein, a part of said protein being still dissolved, freezing the said solution, keeping the solution frozen for from about one to two days, and then thawing and recovering the resultant solid protein material.

3,922,360
SIMULATED SOFT FRUITS

Michael Edwin Sneath, Wellingborough, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,787
Claims priority, application United Kingdom, Jan. 23, 1973, 3334/73
Int. Cl.² A23L *1/06*
U.S. Cl. 426—573 **1 Claim**

1. A process for preparing simulated soft fruit consisting essentially of

a. extruding fruit pulp, puree or juice containing, by weight, from about 0.1 to about 2% of dissolved edible, soluble calcium salt to form drops;
b. simultaneously coating the drops with a thin skin of alginate or pectate sol as said drops are formed by extrusion, said sol containing, by weight, from about 1 to about 4% of alginate or pectate
c. dropping or throwing the coated drops into an aqueous setting bath containing from about 1 to about 10% of dissolved edible, soluble calcium salt; and
d. allowing the thin skin of sol to gel by maintaining the drops in the aqueous setting bath for at least 1 min.

3,922,361
SOFT FROZEN ALL-NATURAL FRUIT JUICE

Edwin L. Vann, 803 Fox Hall, Lakeland, Fla. 33803

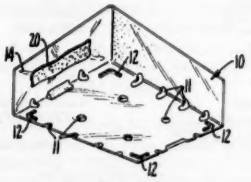
Continuation-in-part of Ser. No. 276,254, July 28, 1972, abandoned. This application Jan. 4, 1974, Ser. No. 430,715
Int. Cl.² A23L *2/02, 2/08*
U.S. Cl. 426—599 **2 Claims**

1. A process for the manufacture of soft frozen all-natural orange-based fruit juice comprising the steps of forming an intermediate concentrate from a frozen base concentrate of said orange fruit juice by thawing to substantially 22° F and then adding a natural sweetener, lactose sugar and a natural flavoring thereto, subsequently adding said intermediate concentrate to an icy slush freezer with water and generating said soft frozen all-natural orange-based fruit juice therefrom, wherein said base concentrate has the following characteristics:
a. Brix = 42.0° to 58.0°;
b. Sugar/acid ration = 14.0:1 to 17.5:1;
c. Oil = 0.014 to 0.018 add back;
d. Enzyme activity = less than 1.5 P.E.U.; and
e. Total pectin = maximum of 375 milligrams per 100 grams of concentrate;
and wherein said soft frozen all-natural fruit juice has an overrun of:
f. 15–30% without inert gas expansion, and
g. 40–60% with inert gas expansion.

3,922,362
SHIPPING CONTAINER

Frank D. Pierce, Salinas, Calif., assignor to Bud Antle, Inc., Salinas, Calif.

Filed Sept. 22, 1969, Ser. No. 859,811
Int. Cl. B65b *53/02*
U.S. Cl. 426—396 **1 Claim**

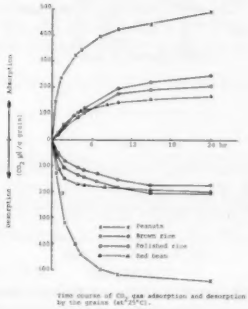


1. The method of bulk packaging produce for shipping to the ultimate consumer, the steps of random packing the produce at the time of harvest in a light weight expanded plastic container having a density of 1 to 2-½ pounds and minimal structural strength said container being open at the top only, wrapping the container with its produce with a stretchable transparent plastic sheeting and stretching the same during the wrapping, said transparent sheeting having a minimum of 10% stretch and 50% recovery, and permitting the plastic sheeting to recover to place the packed container under tension inwardly from all directions without significant distortion of the container and so providing the structural strength for handling, shipping and delivery of the loaded container.

3,922,363
METHOD FOR PACKING FREE-FLOWING MATERIALS

Hisateru Mitsuda; Fumio Kawai; Mutsuo Kuga, all of Kyoto; Fumitaka Saito, Tokyo, and Aijiro Yamamoto, Kyoto, all of Japan, assignors to Japan Foods Storage & Packaging Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 234,816, May 15, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,808
Claims priority, application Japan, Mar. 17, 1971, 46-14915; Apr. 13, 1971, 46-23601; July 30, 1971, 46-57217
Int. Cl.² B65B *31/00*
U.S. Cl. 426—410 **5 Claims**



Time course of CO_2 gas adsorption and desorption by the grains (at 25°C).

1. A method for packing free-flowing materials into a tightly sealed and packed form, said materials being grains or beans which are capable of adsorbing gaseous carbon dioxide when exposed to carbon dioxide and of releasing the carbon dioxide when exposed to air, comprising the steps of placing the materials in a flexible bag which is substantially impermeable to air and gaseous carbon dioxide, introducing gaseous carbon dioxide into the bag and thereby displacing air from the bag, sealing the bag, wherein the partial pressure of gaseous carbon dioxide is in the range of 0.7 to 0.95 and the total volume of all gas is less than that of grains or beans contained therein, and maintaining the bag sealed while the gaseous carbon dioxide is adsorbed by the materials so that the space volume between the bag and the materials is reduced and the flexible bag is drawn tightly about the materials to compress the materials into a tightly sealed and packed form, whereby the materials adsorb a relatively large quantity of gaseous carbon dioxide so long as the bag is kept sealed and may release substantially all of the adsorbed gaseous carbon dioxide after the bag is opened so as to realize preservation of the materials without degeneration thereof.

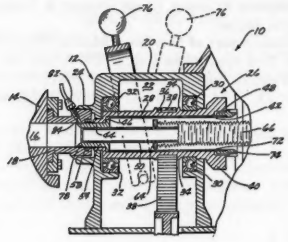
3,922,364
METHOD OF LUBRICATING A MEAT EMULSION

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation-in-part of Ser. No. 222,088, Jan. 31, 1972, abandoned. This application May 16, 1974, Ser. No. 470,517
Int. Cl.² A23L *1/31*
U.S. Cl. 426—413 **4 Claims**

1. A method of lubricating a meat emulsion, comprising the steps of:
introducing meat emulsion into an emulsion stuffing zone, said zone having an emulsion intake end and an emulsion discharge end,
extruding said emulsion in tubular form from said stuffing zone by subjecting the meat emulsion to pressure to move said emulsion from the intake end to the discharge end of said stuffing zone,

introducing a film of lubricating fluid into said emulsion stuffing zone near the emulsion intake end of said zone, said film being in intimate contact with the interior of said zone and



the outer surface of said meat emulsion for substantially the entire length of said emulsion stuffing zone to eliminate emulsion smear along the entire length of said zone.

3,922,365
CHEESE FLAVOR (AMINO ACIDS)

Karl Heinz Ney, Hamburg; I. Poetoe Gde Wirotana, Reillingen, and Wolfram Gustav Freytag, Halstenbek, all of Germany, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 407,702, Oct. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 240,811, April 8, 1971, abandoned. This application Nov. 12, 1974, Ser. No. 523,190

Int. Cl.² A23L *1/226, 1/227, 1/228*

U.S. Cl. 426—534 **4 Claims**

1. In a process for preparing a foodstuff having a ripe cheese flavor, which process includes introducing into a food composition a mixture of volatile cheese flavor ingredients which include the following:

a. alkanoic acids,
b. 2-alkanones,
c. 2-alkanols,
d. aldehydes, and
e. 2-oxoalkanoic acids,

and further with said food composition a mixture of free protein amino acids, the improvement which comprises:

admixing with the food composition at least three amino acids or salts thereof selected from the group consisting of:

i. glutamic acid,
ii. glycine or alanine or proline or a mixture thereof;
iii. lysine; and
iv. methionine; in amounts such that

a. the total amount of free protein amino acids admixed with the food composition is from about 250 to about 60,000 mg per kg foodstuff,
b. the ratio by weight of the sum of the amino acids named in (i) to (iv) to the total free protein amino acids admixed with the food composition is not less than 90%, and
c. the amount of said glutamic acid is 25% to 60% by weight calculated as monosodium glutamate, the amount of said lysine is 10% to 65% by weight calculated as lysine . HCl, the amount of said methionine is 5% to 30% by weight, and the amount of said glycine or alanine or proline or a mixture thereof is 20% to 50% by weight, which percentages are based on the total amount of free protein amino acids admixed with the food composition.

3,922,366
FLAVORING AGENT

Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,683

Int. Cl.² A23L *1/234*

U.S. Cl. 426—535 **16 Claims**

1. As a new composition of matter soluble coffee material to which has been added a minor, but flavor-modifying amount of a compound selected from the group of compounds having the general formula:

$$R_1-CH_2COCH_2S-R_2$$

wherein R_1 represents hydrogen or methyl and R_2 stands for methyl or furfuryl.

3,922,367
PREPARATION FOR IMPARTING SMOKE TO MEAT PRODUCTS

Vasily Matveevich Gorbatov, prospekt Mira, 74, kv. 57; Konstantin Dmitrievich Sinitsin, Polyarnaya ultisa, 56, kv. 57; Nina Nikolaevna Krylova, B. Gnezdnikovsky pereulok, 10, kv. 630; Julia Nazarovna Lyaskovskaya, Tverskoi bulvar, 7/2, kv. 28; Valentina Pavlovna Volovinskaya, ulitsa Akademika Pavlova, I.P., 40, kv. 70; Klavdia Ivanovna Bazarova, Dubninskaya ulitsa, 39, korpus 1, kv. 134; Ljudmila Ivanovna Solovieva, B. Cherkizovskaya ulitsa, 12, korpus 3, kv. 30, and Rimma Igorevna Khlamova, Zhigulevskaya ulitsa 8, kv. 67, all of Moscow, U.S.S.R.

Filed Apr. 3, 1974, Ser. No. 457,719

Int. Cl.² A23L *1/232*

U.S. Cl. 426—536 **2 Claims**

1. A preparation for imparting the smoke and smell of fumed food to meat products consisting of the following components in % by weight:

carbonyl compounds:

furfural	0.05–0.8
valeric aldehyde	0.0002–0.05
dihydroxyacetone	0.0003–0.004
diacetyl	0.0001–0.001
organic acids:	
acetic acid	0.2–1.5
formic acid	0.01–0.1
propionic acid	0.03–0.25
butyric acid	0.001–0.03
valeric acid	0.01–0.1
caproic acid	0.003–0.05
heptanoic acid	0.001–0.01
phenols:	
guaiacol	0.0002–0.01
o-cresol	0.0002–0.01
bases:	
ethylamine	0.00005–0.0008
p-hexylamine	0.00005–0.0008
water or 1% aqueous solution of ethanol	the balance up to 100.

3,922,368
CROCETIN DIESTERS

Heinrich Kiliui, Riehen; Ulrich Manz; Norbert Rigassi, Arlesheim; Gottlieb Ryser, Basel, and Ulrich Schwieter, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 78,911, Oct. 7, 1970, abandoned. This application July 2, 1973, Ser. No. 375,556

Claims priority, application Switzerland, Nov. 31, 1969, 16244/69

Int. Cl.² A23L *1/27*

U.S. Cl. 426—540 **1 Claim**

1. A water dispersible coloring composition comprising as

a coloring agent crocetin di-n-dodecyl ester, an edible emulsifier selected from the group consisting of stearyl lactate, palmitoyl ascorbate, stearyl ascorbate and myristyl ascorbate, and a swellable colloid selected from the group consisting of gelatin, dextrin, gum arabic, sugar fatty acid esters or mixtures thereof.

3,922,369

LOW CALORIE SWEETENING COMPOSITION AND METHOD FOR MAKING SAME

Martin Glicksman, Valley Cottage, N.Y., and Bartley N. Wankier, Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 55,561, July 16, 1970, Pat. No. 3,761,288. This application Aug. 13, 1973, Ser. No. 387,847. The portion of the term of this patent subsequent to Sept. 25, 1990, has been disclaimed.

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **4 Claims**

1. A method for producing a rapidly soluble sweetening composition comprising the steps of forming an aqueous solution of an edible organic acid and a dipeptide sweetening compound, said dipeptide being a lower alkyl ester of aspartylphenylalanine, and said aqueous solution containing less than about one part of said ester per part of organic acid, and freeze-drying the solution.

3,922,370

FOOD PRODUCT AND PROCESS FOR PREPARING SAME

Vinod Prakash, Winterthur, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 244,289, April 14, 1972, abandoned. This application Aug. 7, 1974, Ser. No. 495,416

Claims priority, application Switzerland, Apr. 19, 1971, 5639/71

Int. Cl.² A23L *1/18*

U.S. Cl. 426—559 **13 Claims**

1. A process for preparing a snack product which comprises forming a dough by mixing together water and a dry mix comprising at least 70% by weight of rice flour a major proportion of which is ungelatinised, shaping the dough into separate pieces, subjecting the shaped dough pieces to a heat treatment to gelatinise the starch present, the water content of the dough pieces during the gelatinisation treatment being maintained above 27% by weight, and drying the gelatinised pieces to a water content below 15% by weight.

3,922,371

METHOD OF PREPARING AN ICE CONFECTION AND THE RESULTING PRODUCT

Neal B. Julien, 2929 N. 16th St., Phoenix, Ariz. 85016

Filed Feb. 25, 1974, Ser. No. 445,500

Int. Cl.² A23G *9/00*

U.S. Cl. 426—565 **8 Claims**

1. The method of preparing an ice confection embodying full strength fruit juice comprising the steps of mixing first ingredients comprising a ratio of about 1 pound of pectin stabilizer with about 6 pounds of sucrose, agitating and blending said first ingredients with about 12 to 13 gallons of water, adding about 2½ gallons of a full strength fruit juice to said ingredients, chilling said ingredients at approximately 40°F, blending said ingredients with approximately 1¼ gallons of a second ingredient comprising a mixture containing approximately three quarters of a gallon of a fruit juice in a concentration ratio of approximately 9 to 1 of water to fruit juice, approximately three-eighths of a gallon of corn syrup solids and approximately one-eighth of a gallon of a mixture containing citric acid, sodium citrate and gum arabic, aerating said mixture to a desired consistency, freezing said mixture of said first and second ingredients to approximatley 20°F, and packaging and storing at 0°F or below.

3,922,372

PROCESS FOR THE PRODUCTION OF FISH FLOUR HAVING GEL-FORMING ABILITY

Yoshisuke Hasegawa, Sapporo, Japan, assignor to Mitsubishi Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 246,972, April 24, 1972, abandoned. This application Mar. 5, 1975, Ser. No. 555,631

Claims priority, application Japan, Apr. 22, 1971, 46-25669

Int. Cl.² A22C *25/00*

U.S. Cl. 426—574 **8 Claims**

1. A process for the preparation of an undenatured fish meat powder having the ability to make a fish meat paste of high jelly strength, said process comprising:

separating raw fish meat from salt-free fish bodies;

adding a fatty acid ester and a member selected from the group consisting of oligosaccharides and sugar alcohols to said raw fish meat to form a mixture;

milling said mixture to produce a sol;

adjusting the pH of said sol to a value approximating the isoelectric point of proteins contained in the fish meat; and

spray-drying the sol to produce the fish meat powder.

3,922,373

SOLID MICROGLOBULES CONTAINING DISPERSED MATERIALS

Robert G. Bayless, Yellow Springs, Ohio, assignor to Capsulated Systems, Incorporated, Yellow Springs, Ohio

Filed Mar. 26, 1973, Ser. No. 344,904

Int. Cl.² A23L *1/04*

U.S. Cl. 426—576 **10 Claims**

1. A process of manufacturing a stable, substantially homogeneous edible microglobule, comprising the steps of:

A. providing a continuous-phase vehicle material of water-immiscible liquid;

B. providing a discontinuous phase of solid material as discrete, minute particles, dispersed in said continuous-phase vehicle material, wherein said discontinuous-phase material consists substantially of hydrophilic, polymeric, cross-linkable film forming material and oil-insoluble payload material dispersed in said film-forming material;

C. subsequently adding a liquid water-soluble cross-linking agent, with agitation, to the dispersion of discontinuous-phase particles and the continuous-phase vehicle to harden the discontinuous-phase particles and form stable, substantially homogeneous microglobules thereof of about 1 to 1000 micron size.

3,922,374

PREPARATION OF SIMULATED CHEESE

Richard J. Bell, Sherman; John D. Wynn, Plano; George T. Denton, Plano; Ralph E. Sand, Plano, and David L. Cornelius, Jr., Dallas, all of Tex., assignors to Anderson, Clayton & Co., Houston, Tex.

Continuation-in-part of Ser. No. 344,640, March 26, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,244

Int. Cl.² A23C *19/00*

U.S. Cl. 426—582 **9 Claims**

1. A process for making a food having a final moisture content between about 45 and 49%, a pH of about 4.8 to 5.7 and resembling cheese selected from the class consisting of pasta filata, cheddar and pasteurized process American type, said process comprising,

a. forming an aqueous solution of an acid selected from the class consisting of adipic, lactic, citric, malic and combinations thereof, the solution having a pH between about 2.5 and 3.5, the amount of acid being between about 0.5 and 1.8% of the food, the water in the aqueous solution and in other ingredients present in the food being sufficient to give the food said final moisture content,

b. mixing the aqueous solution of acid with powdered casein no larger than about 80/90 mesh, the amount of casein

being such that the caseinate formed in step (c) is between about 15 and 33% of the food,

c. mixing and reacting calcium hydroxide with the product of step (b) under high shear mixing and subatmospheric pressure thereby forming calcium caseinate, the calcium hydroxide being approximately the stoichiometric amount to react with the casein, and thereafter

d. mixing between about 12 and 35% fat above its melting point with the product of step (c) under high shear mixing and subatmospheric pressure, the fat having a Wiley melting point between about 90° and 110° F., to form said food as a substantially gas-free homogeneous blend of the various ingredients, steps (c) and (d) being in either order.

3,922,375
PREPARATION OF A SOLUBLE WHEY PROTEIN FRACTION

Ernesto Dalan, Vevey; Michel John Arthur Groux, La Tour-de-Peilz, and Jaime Hidalgo, La Tour-de-Peilz, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed July 18, 1973, Ser. No. 380,365

Claims priority, application Sweden, Sept. 11, 1972, 13272/72

Int. Cl.² A23J *1/20*

U.S. Cl. 426—583 **10 Claims**

1. A process for preparing a soluble whey protein fraction which comprises adjusting the pH of an aqueous solution isolated from whey by subjecting a whey fraction to ultrafiltration, molecular sieve filtration or a combination thereof, said solution containing proteins which are substantially undenatured by heat, to a value of 4.4 to 5.0 to form a precipitate, removing the precipitate, separating lipid/protein complexes from the remaining solution by microfiltration with a filter having a filtration threshhold of about 1 micron or less and recovering the filtrate containing a soluble whey protein fraction in solution.

3,922,376
PRODUCTION OF HIGH PROTEIN LOW CALORIE DAIRY SPREAD

Olof Bo Sven Strinning, Hagersten, and Karl-Erik Thurell, Jakobsberg, both of Sweden, assignors to Mjolkcentralen, Ekonomisk Forening, Stockholm, Sweden

Filed Dec. 14, 1973, Ser. No. 424,733

Claims priority, application Sweden, Dec. 15, 1972, 16387/72

Int. Cl.² A23C *3/00*

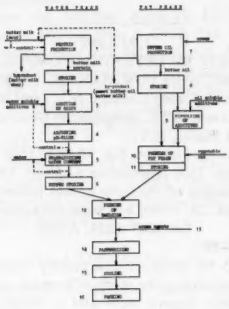
U.S. Cl. 426—603 **11 Claims**

1. A method for the production of a high protein low calorie dairy spread which is spreadable at a refrigerator temperature which comprises the steps of

a. emulsifying at 38°–50° C. an aqueous phase into a fat phase, said aqueous phase being a protein concentrate obtained from buttermilk soured bacteriologically and obtained in the manufacture of butter or butter oil, buffered with citrate and phosphate buffering salts at a pH of 6–7, and diluted with water to a 11–18% protein content wet weight basis, and said fat phase being butter oil or a mixture of butter oil and a polyunsaturated vegetable oil, to form a water-in-oil emulsion having a 20–65% aqueous phase,

b. flash pasteurizing the emulsion,

c. cooling the pasteurized emulsion while working the emulsion as it solidifies, and



d. further cooling the solid emulsion to storage temperature.

3,922,377
HEAT-PROCESSED DEHYDRATED BACTERIOLOGICALLY-STABLE PORK RIND PRODUCT AND PROCESS FOR PREPARING SAME

Kenneth Frederick Whittle, Bridgenorth, England, assignor to Protein Foods (U.K.) Limited, Tipton, England

Filed July 27, 1973, Ser. No. 383,288

Claims priority, application United Kingdom, Aug. 1, 1972, 35959/72

Int. Cl.² A23L *1/31*

U.S. Cl. 426—645 **5 Claims**

1. A heat-processed, dehydrated, bacteriologically-stable, pork rind product capable of rapid rehydration having a water content from about 4% to about 15% by weight, a fat content from about 4% to about 20% by weight, a protein content between 70% and 96% by weight, and a particle size from about 0.5mm to about 5mm, said percentages being based on the total weight of the product.

3,922,378
FLUORINATED HYDROCARBON COATING METHOD

William M. Kline, Gloversville, N.Y., assignor to Medical Evaluation Devices & Instruments Corporation, Gloversville, N.Y.

Continuation-in-part of Ser. No. 278,099, Aug. 4, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,302

Int. Cl. B44d *1/42;* **H01b** *3/44*

U.S. Cl. 427—2 **9 Claims**

1. A method of applying and firmly bonding a fluorinated hydrocarbon resin coating to the exposed surface of a clean flexible metallic substrate selected from the group consisting of a coil spring in which the helices thereof are in mutual contact and a fine conducting wire of small area cross-section and comprising the steps of: supplying a liquid dispersion bath of a fluorinated hydrocarbon resin selected from the group consisting of hexafluoropropylene-tetrafluoroethylene copolymer and tetrafluoroethylene; slowly immersing said substrate in said dispersion bath under non-agitated conditions for about 2–30 minutes to effect a coating of said dispersion thereon and then slowly removing said substrate from said dispersion bath; then subjecting said removed dispersion coated substrate to a preliminary heating in a non-turbulent atmosphere at a temperature not exceeding about 180°F for about 10–120 minutes; then cooling said prelimarily heated dispersion coated substrate to about the ambient temperature

of the atmosphere; then subjecting said preliminarily heated and cooled dispersion coated substrate to a further heating to a temperature of about 545° – 700° F for about 10–180 minutes whereby to drive off any non-resin portions of said dispersion coating and to cause the resin thereof to form as a hot melt in contact with said substrate; and then slowly cooling the thus further heated resin coated substrate to a temperature at least as low as about 150°F over a period of about 30–180 minutes, whereby to cause the resin coating thereof to become firmly bonded thereto as an unbroken flexible transparent film.

3,922,379
MICROENCAPSULATION PROCESS

Bahram Farhadieh, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

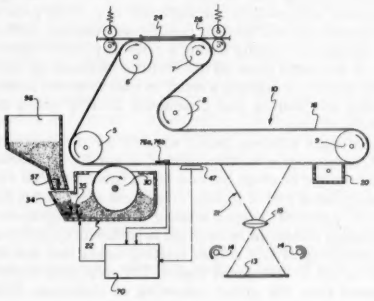
Filed Dec. 17, 1973, Ser. No. 425,456
Int. Cl.² A61K *9/38*
U.S. Cl. 427—3 **6 Claims**

1. The process of preparing essentially tasteless particles of an orally active derivative of erythromycin, consisting essentially in suspending particles of 10 – 150 microns diameter of said erythromycin derivative in water adjusted to a pH above 7.0, containing or dissolving therein a water-soluble protein, which is heat coagulable at a temperature between 50° and 80° C., stirring said suspension into a liquid alkane containing 1 – 10% by weight of a nonionic surfactant, emulsifying the mixture, heating said mixture under stirring for a period sufficient to coagulate said heat coagulable protein, and collecting the coated particles solid from said suspension.

3,922,380
AUTO BIAS CONTROL METHOD

Stephen Royce Rowell, and David Charles Hogan, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 370,997, June 18, 1973. This application Dec. 5, 1974, Ser. No. 529,880
Int. Cl.² G03G *13/16*
U.S. Cl. 427—8 **1 Claim**



1. A method for controlling the potential applied to a development electrode of a development station comprising the steps of:

a. sensing downstream of the development station the charge level of longitudinal increments of a charged image area moving along a predetermined path at substantially a constant speed, and producing first analog signals representative thereof;

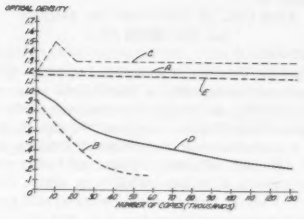
b. converting said first analog signals to digital signals and storing same at particular storage locations; and

c. reconverting after selected time delay each of said digital signals to a second analog signal and applying a corresponding potential to said second analog signal to said electrode.

3,922,381
CHEMICALLY TREATED CARRIER PARTICLES FOR USE IN ELECTROPHOTOGRAPHIC PROCESS

Pabitra Datta, Lyndhurst, Ohio, assignor to Addressorgrap Multigraph Corporation, Cleveland, Ohio

Filed June 14, 1974, Ser. No. 479,298
Int. Cl.² G03G *13/08, 13/09*; B05D *5/12*; C03C *17/28*
U.S. Cl. 427—21 **18 Claims**

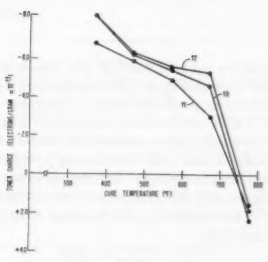


1. A carrier for use in electrophotographic development of latent electrostatic images capable of inducing an electrostatic charge in a toner mixed therewith which comprises a member selected from the group consisting of metallic particles and siliceous particles to the surface of which is adhered a member selected from the group consisting of perfluorinated and substantially perfluorinated carboxylic acids containing from 3 to 18 carbon atoms and esters and amides thereof.

3,922,382
METHOD OF MANUFACTURING CARRIER PARTICLES

William J. Kukla, Boulder, and Howard E. Munzel, Lafayette, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 110,725, Jan. 28, 1971, Pat. No. 3,798,167. This application Oct. 1, 1973, Ser. No. 402,509
Int. Cl.² G03G *9/00*
U.S. Cl. 427—58 **15 Claims**



1. A method of selectively controlling the magnitude of the triboelectric charge characteristic of an electrophotographic development carrier for use with toner particles in an electrophotographic system including:

coating a plurality of core particles which will withstand a selected curing with a substantially continuous film of a material comprising at least essentially a substantially insoluble fluoropolymer;

and selecting the curing of the coating to firmly adhere the coating to each of the core particles and to control the magnitude of the triboelectric charge characteristic of the electrophotographic development carrier with respect to toner particles of a given composition and a given percent by weight of said toner particles relative to said carrier and a given electrophotographic system with which the carrier and toner particles are to be used, said magnitude

being within a range to produce good quality copy when used in said electrophotographic system, said copy exhibiting good edge definition and image fill characteristics.

3,922,383

POLYMERIC LAMINATES

Alan D. Wilks, Mount Prospect, and Karl J. Youtsey, Chicago, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 28, 1974, Ser. No. 446,889
Int. Cl.² B05D 5/12
U.S. Cl. 427—82 **6 Claims**

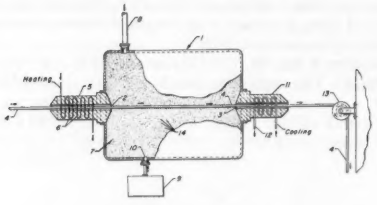
1. A polymeric laminate, the surface lamina of which comprises a polymer containing a particulate semiconducting material comprising an inorganic refractory oxide having a surface area of from about 1 to about 500 square meters per gram and a carbonaceous pyropolymer forming at least a monolayer on said refractory oxide, said semiconducting material possessing a resistivity of from about 0.001 ohm centimeters to about 10^{10} ohm centimeters, said particles of semiconducting material being less than 100 microns in size and being present in said surface lamina in an amount of from about 10% to about 50% by weight of said surface lamina.

3,922,384

ELECTRICALLY CONDUCTIVE FIBERS

Thomas D. Tadewald, La Crosse, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 3, 1974, Ser. No. 485,669
Int. Cl.² B05D 5/12
U.S. Cl. 427—87 **13 Claims**



1. A method for the preparation of a synthetic or naturally occurring fiber containing a semi-conducting pyropolymeric inorganic refractory oxide material impregnated on the surface thereof which comprises heating said fiber to about a glass transition temperature, passing said heated fiber through an environment of said semi-conducting pyropolymeric inorganic refractory oxide material and impregnating said material on the surface of said fiber, in an amount of from about 35% to about 60% by weight of the finished fiber, cooling and recovering said fiber.

3,922,385

SOLDERABLE MULTILAYER CONTACT FOR SILICON SEMICONDUCTOR

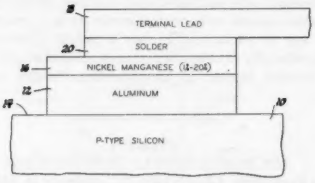
Mark L. Konantz, and Ronald K. Leisure, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 375,688, July 2, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,350
Int. Cl.² B44D 1/14, 1/18
U.S. Cl. 427—90 **2 Claims**

1. A method of forming an improved solderable multilayer electrode on a silicon body comprising the steps of:

vacuum depositing an aluminum layer at least about 3,000 angstroms thick onto a surface of a silicon body,

heating said silicon body and said aluminum layer to shallowly alloy said aluminum layer with said silicon surface at their interface and reduce electrical resistance between said layer and said surface, and



thereafter vacuum depositing onto said aluminum layer a layer at least about 3,000 angstroms thick of an alloy consisting essentially of nickel and about 1% – 20% by weight manganese.

3,922,386

PROCESS FOR THE MANUFACTURE OF SMALL HEAT-ENERATING PRINTED CIRCUITS

Bonifacio Echavarri Ros, Cordovilla, Spain, assignor to Orbaiceta, S.A., Cordovilla, Spain

Filed Jan. 26, 1973, Ser. No. 327,027
Claims priority, application Spain, Apr. 12, 1972, 401.673
Int. Cl.² B44D 1/18
U.S. Cl. 427—96 **11 Claims**

1. A process of manufacturing small printed circuits for the generation of heat, comprising the steps of depositing a ceramic dielectric coating on a metal substrate, allowing the ceramic-coated substrate to stand at room temperature for a period long enough for any defects in said ceramic coating to become evident, degreasing said ceramic coating, depositing from a metal-spray gun an adherent conductive coating of a metal chosen from the group consisting of aluminum, zinc and copper mixed with the oxide of said chosen metal on said ceramic coating, said ceramic-coated substrate having been preheated to a temperature sufficient to provide good adhesion thereto of said sprayed conductive coatings, said adherent conductive coating having a resistivity much higher than that of the metal alone as the result of inclusion of the metal oxide therein, depositing a resist on said adherent conductive coating and shaping said conductive coating into a desired form by etching.

9. A small printing circuit suitable for the generation of heat, comprising a metal substrate, a plurality of individually fired ceramic coatings on said metal substrate, said ceramic coatings being free of scaling, cracks and other visible defects, and an adherent, shaped coating of a flame sprayed metal containing inclusions of its oxide in sufficient quantity so that the resistivity of said shaped coating makes said circuit suitable for use at voltages as high as 220 volts, said metal being selected from the group consisting of aluminum, zinc and copper.

3,922,387

METALLIZATIONS COMPRISING NICKEL OXIDE

John Robert Larry, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 392,240, Aug. 28, 1973, Pat. No. 3,854,957. This application June 5, 1974, Ser. No. 476,538
Int. Cl.² B05D 5/12
U.S. Cl. 427—96 **6 Claims**

1. Electrical conductors on a ceramic substrate, the conductors consisting essentially of metallizations of finely divided powders comprising noble metals and 0.1–10% nickel oxide, by weight of the nobel metal present.

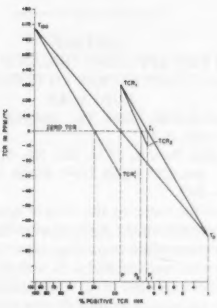
3,922,388
METHOD OF MAKING AN ENCAPSULATED THICK FILM RESISTOR AND ASSOCIATED ENCAPSULATED CONDUCTORS FOR USE IN AN ELECTRICAL CIRCUIT

Sergei Schebalin, Ambler, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 334,956, March 22, 1973, abandoned, which is a division of Ser. No. 120,199, March 2, 1971, Pat. No. 3,788,891. This application Nov. 20, 1974, Ser. No. 525,587

Int. Cl.² H01H *37/36*; H01B *1/02*

U.S. Cl. 427—103 1 Claim



1. A method of making an encapsulated thick film resistor having conductive portions associated with opposite ends thereof that form portions of an electrically conductive circuit, comprising the first step of selecting an ink from a mixture of positive and negative resistor inks, the second step of firing the resistor ink mix in amorphic form at 1000°C into a sintered state onto an electrically non-conductive substrate, the third step of selecting a conductive ink material that has a sintering temperature substantially lower than the sintering temperature of the resistor, the fourth step of firing said conductive ink at a sintering temperature of about 550°C in overlapping relationship with said opposite ends of said resistor on the substrate whereby the tendency to diffusion between the conductive and resistive materials is minimized and whereby a resulting temperature coefficient of resistivity value of the resistor that is produced is within plus or minus 20 parts per million per degree centigrade from zero, the fifth step of applying a coating of resilient buffer material formed of a silicone polymer filled with magnesium oxide to cover said resistor and the said fired conductive ink and the sixth step of applying a layer of iron oxide with magnesium silicate suspended in xylene to cover the outer surface of said resilient material.

3,922,389
METHOD FOR PROTECTIVELY COATING MAGNETIC WIRE

Emil Toledo, Natick; Luke Dzwonczyk, Marlboro, both of Mass., and Rodger Shih-Yah Mo, Redondo Beach, Calif., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 216,268, Jan. 7, 1972, Pat. No. 3,816,185, which is a division of Ser. No. 20,851, March 18, 1970, abandoned. This application Mar. 14, 1974, Ser. No. 450,962

Int. Cl.² H01F *10/00*

U.S. Cl. 427—130 4 Claims

1. A method for applying a protective coating on magnetic memory wire comprising a wire conductor having a permalloy coating comprising the steps of:

passing said wire through an aqueous alkaline solution comprising an organic corrosion inhibitor comprising thiazole and an inorganic PH stabilizer from the group consisting of borate, benzoate and phosphate salts of sodium and potassium and combinations thereof to form a coating on said wire; and

passing said coated wire through a furnace having an air atmosphere therein maintained at a temperature between about 300°C and 400°C.

3,922,390
METHOD FOR IMPROVING THE READABILITY DURING OPTICAL SCANNING OF AUTOMATIC CAR IDENTIFICATION LABELS

Joseph V. Otrhalek, Dearborn, and Robert E. Gansser, Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 1, 1974, Ser. No. 510,891

Int. Cl.² B05D *5/06*, *1/00*, *3/00*

U.S. Cl. 427—162 3 Claims

1. A method for improving during optical scanning, the readability of automatic car identification labels comprising

a. applying a continuous coat of a thickened acid cleaner composition consisting essentially of

1. an aqueous hydrochloric acid in an amount from about 15 to about 40 weight percent,
2. an organic acid selected from the group consisting of oxalic, tartaric, citric acid and mixtures thereof in an amount from about 1 to about 6 weight percent,
3. a nonionic surfactant in an amount from about 7 to about 23 weight percent,
4. an anionic surfactant in an amount from about 1 to about 7 weight percent, and
5. water in an amount from about 76 to about 24 weight percent;

all weight percents being based on the total composition, provided that the said nonionic surfactant and the said anionic surfactant when taken together constitute from about 10 to about 30 weight percent of said composition and said nonionic surfactant constitutes from about 75 to about 90 weight percent of the combined weight percent of nonionic and anionic surfactants,

b. allowing said coat to remain on said labels during said scanning.

3,922,391
PRODUCTION OF SHEET MATERIAL FOR USE AS GASKETS

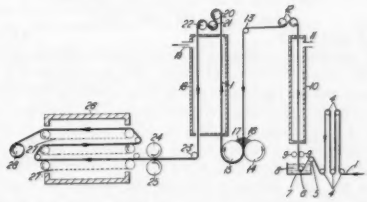
John Geoffrey Qualtrough, Bolton; Harry Thornley, and David John Adams, both of Rochdale, all of England, assignors to TBA Industrial Products Limited, Manchester, England

Continuation of Ser. No. 197,448, Nov. 10, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,321

Claims priority, application United Kingdom, Nov. 20, 1970, 55368/70

Int. Cl.² B29C *17/02*

U.S. Cl. 427—174 14 Claims



1. A process for producing in indefinitely long lengths composite sheet material comprising a metal core having a fibre-

reinforced elastomer permanently secured to both sides thereof, said process comprising the steps of compounding a curable dough from fibre, elastomer, curatives and a solvent system including a volatile solvent for the elastomer and a liquid which is a non-solvent for said elastomer, pelletizing, said curable dough, coating both sides of the core with an adhesive capable of being tackified by the solvent for the elastomer, then drawing the metal core through a nip between two calender rolls by means of a tensioning device acting on the core downstream of said nip to draw the core at a speed equal to the surface speed of the calender rolls, feeding pellets of said curable dough simultaneously to both sides of said core as it enters said nip, with said non-solvent liquid serving to prevent adhesion of the dough to the rolls, while controlling the feed and viscosity of the curable dough so that coatings of said dough are spread evenly over both sides of the core, drying said coatings prior to the tensioning device, and subsequently curing the coatings.

3,922,392

PROCESS FOR COATING NONPOROUS MATERIAL WITH A POROUS SILICON DIOXIDE LAYER

Hans Wolfgang Kohlschutter; Klaus Unger, and Jurgen Schick-Kalb, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed May 25, 1973, Ser. No. 364,117

Claims priority, application Germany, May 27, 1972, 2225973

Int. Cl.² B05D *7/00*

U.S. Cl. 427—215 **9 Claims**

1. A process for coating a nonporous material with a porous silicon dioxide layer suitable for use in chromatography, which comprises:

a. coating said nonporous material with a preformed polymeric tetraalkoxysiloxane consisting essentially of alkoxy groups and cross-linked siloxane groups, havng a molecular weight of about 1,000–5,000 and a kinematic viscosity of 100–500 centistokes to form a thin, uniform coating thereon; and

b. subjecting the resultant coated material to hydrolytic polycondensation by treatment with an aqueous solution having a hydroxyl ion concentration of 1×10^{-3} to 1.5 moles per mole of SiO_2 in the polyalkoxysiloxane employed, said aqueous solution consisting essentially of water and a basic compound, to produce a layer of porous, polymeric silicon dioxide hydrogel thereon having a thickness of 0.1 –100μ and an average pore diameter of 30–800 A.

3,922,393

PROCESS FOR POLISHING SILICON AND GERMANIUM SEMICONDUCTOR MATERIALS

George Wallace Sears, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed July 2, 1974, Ser. No. 485,270

Int. Cl.² B05D *7/00, 7/24*

U.S. Cl. 427—215 **8 Claims**

1. A process for polishing semiconductor material selected from the group consisting of silicon and germanium to a high degree of surface perfection comprising polishing the material with a modified colloidal silica sol having a pH between about 11 to 12.5 in which the colloidal silica particles are coated with chemically combined atoms of aluminum to give a surface coverage of about 1 to about 50 aluminum atoms on the surface per 100 silicon atoms on the surface of uncoated particles, the particles of said modified silica sol having a specific surface area of about 25 to about 600 square meters per gram and said sol having a silica concentration of about 2 to about 50% by weight.

3,922,394

METHOD FOR COATING FERROUS-METAL MASK FOR CATHODE-RAY TUBE

Gerald Scott Lozier, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,322

Int. Cl.² B32B *3/10;* **B05D** *3/02*

U.S. Cl. 427—247 **4 Claims**

1. A method for reducing the sizes of apertures in a ferrous metal mask for use in manufacturing a cathode-ray tube comprising coating at least one surface of said mask with a water-based coating composition consisting essentially of a polyvinyl pyrrolidone polymeric material present in said coating composition in concentrations of about 2 to 7 weight percent, and then drying said coating.

3,922,395

METHOD FOR APPLYING ORGANIC POLYMERIC COATING COMPOSITION TO FERROUS-METAL SURFACES

Bradford Knox Smith, Lititz, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,323

Int. Cl.² B32B *3/10;* **B05D** *3/02*

U.S. Cl. 427—247 **3 Claims**

1. A method for reducing the sizes of apertures in a ferrous metal mask comprising the steps of coating said mask with a water-based composition consisting essentially of a polyvinyl alcohol polymeric material and 0.01 to 0.50 weight percent of the coating composition of a water-soluble passivator for ferrous-metal surfaces, and then drying said coating.

3,922,396

CORROSION RESISTANT COATING SYSTEM FOR FERROUS METAL ARTICLES HAVING BRAZED JOINTS

Kenneth K. Speirs; Martin Weinstein, and Michael F. Dean, all of San Antonio, Tex., assignors to Chromalloy American Corporation, New York, N.Y.

Division of Ser. No. 353,800, April 23, 1974, Pat. No. 3,859,061. This application Sept. 25, 1974, Ser. No. 509,049

Int. Cl. B44d *1/14;* **C23c** *9/02;* **C23f** *17/00;* **C03c** *7/02;* **C23d** *5/04*

U.S. Cl. 427—250 **7 Claims**

1. A method of aluminizing a brazed ferrous metal article characterized by at least one brazed joint, the braze of said joint being formed of a non-ferrous brazing alloy of melting point ranging from about 1125°F to 1925°F which comprises: coating the entire surface of said ferrous metal article with an adherent coating of an aluminide-forming metal selected from the group consisting of iron, nickel, cobalt and chromium,

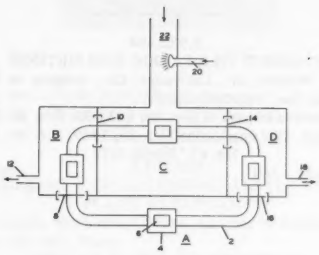
and thermally diffusing aluminum into the entire surface of said article including the coated braze,

whereby a sacrificial coating comprising said aluminum is produced, the aluminum coating being characterized by the presence of an aluminide compound selected from the group consisting of iron aluminide, nickel aluminide, cobalt aluminide and chromium aluminide.

3,922,397
METHOD AND APPARATUS FOR BLEACHING FURNITURE

John W. Baymiller, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 253,172, May 15, 1972, abandoned, which is a division of Ser. No. 101,487, Dec. 28, 1970, Pat. No. 3,708,889. This application Mar. 4, 1974, Ser. No. 447,894
Int. Cl.² D06L 3/02
U.S. Cl. 427—254 2 Claims



1. The method of bleaching furniture components in a treatment apparatus comprising the stepsof:

a. moving a plurality of furniture components on an intermittently operated conveyor structure to move the furniture components in an endless path,

b. opening an entrance door to a first air lock means and moving a first furniture component into said first air lock,

c. closing said entrance door to said first air lock means and then opening an exit door of said first air lock means, said exit door connecting said first air lock means with furniture component treatment area,

d. moving said first furniture component from said first air lock to said treatment area, and then closing said first air lock means exit door,

e. moving a second furniture component into said first air lock means,

f. spraying aqueous ammonia into said treatment area and bleaching said first furniture component with the ammonia for the required period of time,

g. opening an entrance door to a seond air lock means, said last mentioned entrance door connecting said treatment area with said second air lock means,

h. moving said first furniture component into said second air lock means, and closing the entrance door of said second air lock means while at the same time moving said second furniture component into said treatment area,

i. then opening an exit door of said second air lock means and moving said first furniture component from said second air lock means to the point wherein the first furniture component started its movement towards the first air lock means.

3,922,398
METHOD FOR FORMING FIBROUS SAUSAGE CASINGS

Douglas J. Bridgeford, Champaign, and Frank M. McNeil, Lombard, both of Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed May 8, 1974, Ser. No. 467,978
Int. Cl.² B44D 1/52
U.S. Cl. 427—259 16 Claims

1. In a method for forming a tubular fibrous sausage casing which includes the steps of extruding a porous web as a tube, impregnating said porous web with a polymeric dope in an impregnation zone, coagulating and regenerating the polymer, venting fluids which accumulate inside said tubular casing during coagulation and regeneration, and then drying; the improvement for venting fluids from said tubular casing which comprises:

masking a section of said porous web with a masking agent prior to the step of impregnating said web with polymeric dope thereby preventing said section from becoming impregnated; and, then,

removing said masking agent thereby leaving an uncoated section after said casing has passed through said impregnation zone,

coating said uncoated section of said casing with a flexible, film-forming, air-impermeable material after said casing has passed through the regenerating zone and prior to drying.

3,922,399
DUAL SURFACE TEXTILES

Arnold G. Ochsner, Holderlinstrasse 23, 9008 St. Gallen, Switzerland

Filed June 21, 1974, Ser. No. 481,852
Int. Cl.² B05D 5/04
U.S. Cl. 427—261 4 Claims

1. The process of producing waterrepellant fabric material receptive to color prints which comprises first water-proofing said fabric material with resins and moisture-proofing plasticizers, applying a coat of polyester which has been treated with a coating consisting essentially of a cellulosic film-forming polymer having applied thereon a top coating of a solid continuous copolymer consisting of a vinylpyrrolidone component and a vinyl acetate component wherein said vinylpyrrolidone component comprises 5%–55% by weight of said copolymer to cause said polyester to become receptive to color dyes, applying color prints to a paper carrier, causing said paper carrier to contact the fabric, and applying pressure to prints to cause them to be transferred to the fabric.

3,922,400
CHEMICAL PLATING METHOD

Toru Kawanobe, and Kanji Otsuka, both of Kodaira, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 23, 1973, Ser. No. 390,843
Claims priority, application Japan, Aug. 25, 1972, 47-84551
Int. Cl. B44d 1/18; C09d 5/00; C23c 3/00
U.S. Cl. 427—265 17 Claims

3. The method of claim 2, wherein said ceramic material is composed mainly of alumina, silica and magnesia.

7. The method of claim 2, wherein said second conductive layer has a surface of nickel.

12. The method of claim 2, wherein gold is selectively plated on said second conductive layer by means of a gold plating solution comprising potassium gold cyanide, nickel chloride and sodium citrate.

17. The method of claim 16, wherein said first metallized layer is an electrolessly coated layer of tungsten, molybdenum, molybdenum-manganese or mixtures thereof, wherein said second metallized layer is spaced from said first metallized layer and comprises a layer of molydbenum containing 0.5 to 5 % by weight palladium, and wherein said second metallized layer is electrolessly plated with gold by means of a gold plating solution consisting essentially of potassium gold cyanide, nickel chloride and sodium citrate.

3,922,401

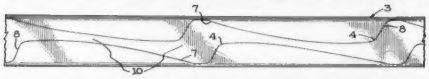
IMITATION FEATHER FLETCHING AND METHOD OF MAKING SAME

Fred B. Bear, Grayling, Mich., assignor to Victor Comptometer Corporation, Chicago, Ill.

Division of Ser. No. 406,961, Oct. 16, 1973, which is a continuation of Ser. No. 248,019, April 27, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 516,638

Int. Cl.² B32B *31/18*

U.S. Cl. 427—290 **7 Claims**



1. A method of making an imitation feather for arrows comprising, forming a starting strip of synthetic material of indefinite length, said strip including a web joined to a base flange having a pair of oppositely disposed foot portions, stamping said starting strip to provide a continuous score line extending in a repeating manner throughout the length of the starting strip web to define a plurality of longitudinally adjacent feather blade portions in said web on the one side and a waste strip on the other side, each said blade portion bounded at opposite ends by said score lines extending to points juxtaposed said base flange, and removing said waste strip to provide a plurality of feather blade portions all joined to a continuous base flange to provide a feather strip.

3,922,402

PRODUCTION OF ARTIFICIAL LEATHER

Hidehiko Shimamura, and Hirozo Fujita, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 29, 1974, Ser. No. 456,100

Claims priority, application Japan, May 7, 1973, 48-51031

Int. Cl.² B44D *1/14*

U.S. Cl. 427—336 **11 Claims**

1. A method of preparing an artificial leather which comprises a substrate containing as an A-polymer a polyurethane elastomer and a surface layer containing as a B-polymer a polyurethane elastomer different from the A-polymer, said method comprising the steps of (1) impregnating a solution or liquid dispersion containing the A-polymer in a fibrous mat, to give an A-polymer impregnated mat, (2) coating the impregnated mat with a solution or liquid dispersion containing a composition comprising the A-polymer and the B-polymer in a ratio of from about 65:35 to about 9:98, (3) applying a surface layer by coating the coated impregnated mat with a solution or liquid dispersion containing the B-polymer, and (4) coagulating the resulting coated impregnated mat produced in step (3).

3,922,403

SCALE CONTROL

Thomas E. Sample, Jr., and Jack F. Tate, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 142,014, May 10, 1971, abandoned. This application May 30, 1972, Ser. No. 257,726

Int. Cl. B44d *1/44*; B32b *15/08*

U.S. Cl. 427—340 **11 Claims**

1. A process for producing a fully cured, infusible coating which when applied to surfaces normally susceptible to the deposition of mineral scale substantially improves the resistance of said susceptible surfaces to said scale, said process comprising the steps of:

a. applying to the substrate whose resistance to scaling is to be improved, an acid or base catalyzed phenolic-aldehyde resin condensate containing a substantial number of reactive hydroxyl groups, said groups being susceptible to oxyalkylation by a base catalyzed reaction with alkylene carbonate; and

b. contacting said resin condensate coated on said substrate with a composition comprising at least a catalytic quantity of basic catalyst and at least two moles of molten alkylene carbonate per mole of phenolic hydroxyl groups at a temperature ranging from about 350° to 380°F., until the surface of said coated substrate which is normally susceptible to scaling is converted into a surface having substantially improved scale-resistant properties; then,

c. curing said resin having scale-resistant properties, until it becomes a fully cured, infusible coating bonded to the normally scale-susceptible surface.

3,922,404

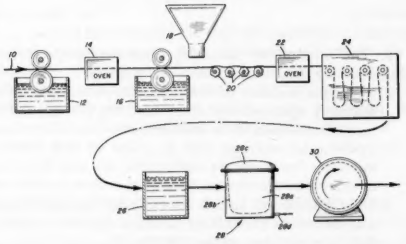
CRUSHED PILE FABRIC AND METHOD

Amos U. Priester, Jr., LaGrange, Ga., assignor to Deering Milliken, Inc., Spartanburg, S.C.

Continuation-in-part of Ser. No. 803,335, Feb. 28, 1969, abandoned. This application Oct. 20, 1969, Ser. No. 49,374

Int. Cl.² D06M *9/14*

U.S. Cl. 427—369 **10 Claims**



1. A method for producing a crushed pile fabric comprising the steps of

a. wetting a length of tufted pile fabric capable, when wet, of receiving a substantially permanent crush upon the application of pressure;

b. forming the wet fabric into a crumpled ball-shaped mass; and

c. applying an inwardly directed force to a major portion of the outer surface of the wet mass from a plurality of directions and in the general direction of the center of the mass to compress the same, express excess liquid therefrom and randomly and permanently crush the pile.

3,922,405

METHOD FOR FORMING OF A CARBIDE LAYER OF A V-A GROUP ELEMENT OF THE PERIODIC TABLE ON THE SURFACE OF AN IRON, FERROUS ALLOY OR CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoake; Tohru Arai; Yoshihiko Sugimoto, both of Nagoya, and Masayoshi Mizutani, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Kagoya, Japan

Filed Apr. 27, 1973, Ser. No. 355,280

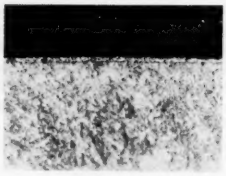
Claims priority, application Japan, Apr. 12, 1973, 48-40822

Int. Cl.² C23C *9/10*; C23F *7/00*

U.S. Cl. 427—399 **9 Claims**

1. A method for forming a carbide layer on the surface of an iron, ferrous alloy or cemented carbide article in a molten bath, comprising the steps of preparing the molten bath consisting essentially of a chloride of an element selected from the group consisting of vanadium, niobium, tantalum and mixtures thereof and one member selected from the group consisting of boric acid, a borate and mixtures thereof, immersing

the article containing at least 0.05 percent of carbon into said molten bath, maintaining said article in said molten bath for



(×400)

forming the carbide layer of said element on the surface of said article, and removing the article out of the molten bath.

3,922,406

RENDERING A CELLULOSE-POLYESTER FABRIC FLAME RETARDANT

Jay C. Chapin, Marblehead, Mass., assignor to Ventron Corporation, Beverly, Mass.

Filed July 6, 1973, Ser. No. 377,028
Int. Cl.² C09K *3/28*
U.S. Cl. 427—402 **2 Claims**

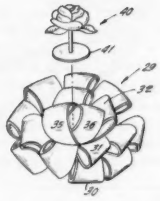
1. The method of rendering a cotton-polyester fabric flame retardant which comprises first impregnating the fabric with an aqueous liquor comprising water, a carrier normally used for dyeing polyester fabrics, an emulsified aqueous liquor of tris, 2, 3, dibromopropylphosphate, raising the temperature of the liquor to about 180°F. while acidifying it with acetic acid, drying the fabric and thermosoling it for 30 seconds at a temperature of about 415°F., thereafter passing the treated fabric through an aqueous solution containing precondensate of tetrakis (hydroxymethyl phosphonium chloride and sodium acetate), removing water from the fabric to reduce its moisture content to about 10 percent by weight of the original weight of the dry fabric, placing the thus treated fabric in an atmoshphere of ammonia gas for about 10 minutes and then in an aqueous solution of hydrogen peroxide and a neutral soap, and finally drying the fabric.

3,922,407

CIRCULAR GENERATING POMPON BOW STRUCTURE

Philip E. Nimmo, Jr., 29 Lake Trail East, Wayne, N.J. 07470, and Arthur H. Steller, 16 Florham Ave., Florham Park, N.J. 07932

Filed Mar. 27, 1970, Ser. No. 23,144
Int. Cl.² D04D *7/10*
U.S. Cl. 428—5 **1 Claim**



1. A decorative bow formed of a single continuous ribbon comprising, in combination:

a. a plurality of bow loops radiating outwardly from a common central region;

b. a plurality of circular loops extending upwardly from said common central region and filling in the center of said bow to form a circular cluster of loops with said bow loops;

c. a generally flat bottom surface and a bow mounting member disposed at the center of said flat bottom surface;

d. a securing means for securing together said bow loops, said circular loops and said mounting member; and

e. an ornament having a thin post extending therefrom and a flange extending from the end of said thin post, said flange being disposed under and within two adjacent circular loops to connect said ornament to said bow.

3,922,408

CORNER AND EDGE PROTECTIVE COVERS

Josephine Lee Smith, 15440 SW. 81st Ave., Miami, Fla. 33157

Filed June 24, 1974, Ser. No. 481,979
Int. Cl.² A47B *95/00*
U.S. Cl. 428—40 **7 Claims**

1. Cover means for potentially dangerous, exposed corners and edges, for example, of counter-tops, tables and cabinets comprising:

A. a cap member to fixedly, protectively cover such exposed corner of a counter-top, table, or cabinet comprising

1. a vertical, angular portion, integrally formed of a pair of flanges, disposed at right angles to each other, and

2. a top horizontal flange connecting between the top edges of the vertical flanges;

B. an elongated angle member to fixedly, protectively cover each exposed edge, comprising a pair of integrally formed flanges disposed at right angles to each other,

wherein said cap and elongated angle members are formed of a soft, resilient material selected from the group consisting of plastic, a foamed plastic, a rubber and a sponged rubber, and

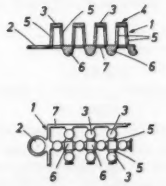
wherein each of said cap member and elongated angle member is adhesively fixed in place throughout the entire surface contact of said cap member with said exposed corners and edges.

3,922,409

FOOTMAT

Erwin Stark, Auhirschgasse 34, Linz, Austria

Filed Jan. 21, 1974, Ser. No. 435,314
Claims priority, application Austria, Jan. 26, 1973, 722/73
Int. Cl.² E04F *10/00*
U.S. Cl. 428—44 **8 Claims**



1. A mat comprising:

a. a plurality of spaced head portions having respective exposed faces, said faces jointly defining a first surface;

b. a plurality of elongated foot portions associated with each head portion and extending away from the associated head portion transversely of said first surface; and

c. a plurality of spaced node portions having respective exposed faces jointly defining a second surface parallel to said first surface,

1. each node portion being connected to two of said head portions by respective ones of said foot portions,

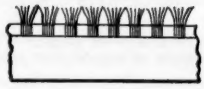
2. said head portions defining therebetween a plurality of first passages extending through said mat from said first surface to said second surface,

3. said foot portions defining a plurality of second passages extending between said surfaces and connecting first passages.

3,922,410
PROCESS FOR OBTAINING FLOCKED FABRICS AND FABRICS OBTAINED THEREFROM

John B. Halloran, Somerset, Mass., assignor to United Merchants and Manufacturers Inc., New York, N.Y.

Filed Aug. 1, 1973, Ser. No. 384,599
Int. Cl.[2] B05D *1/14*, *1/16*
U.S. Cl. 428—88 7 Claims



1. A method for producing a flocked laminate which comprises:

a. coating a substrate with a curable adhesive flock binder;

b. flocking the coated substrate with particles of flock, each particle being composed of a plurality of filaments disposed side-by-side to each other and being temporarily adhered together by a removable binder to form a single bundle of said filaments, the flocking being carried out in a manner such that one end of each bundle is embedded in the curable binder coating and the bundles are substantially upstanding;

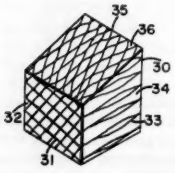
c. curing the thus flocked substrate to permanently secure the embedded end of the bundle to the substrate; and

d. removing the temporary binder from the secured bundle whereby the unsecured ends of the filaments of said bundles spread out in a blossom formation.

3,922,411
HONEYCOMB REINFORCED MATERIAL AND METHOD OF MAKING THE SAME

Salvatore Motta; Bernard Walter Rosen, both of Lawrence, and Thomas Vasilos, Winthrop, all of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed June 2, 1958, Ser. No. 740,987
Int. Cl.[2] B32B *3/12*
U.S. Cl. 428—116 4 Claims



1. An improved material comprising fused silica, the amorphous phase of silicon dioxide, a honeycomb structure, said fused silica being a solidified block and inserted in the interstices of said honeycomb and transverse reinforcing members secured to said honeycomb and extending through the interstices of said honeycomb and said fused silica.

3,922,412
THIN-WALLED CARBONACEOUS HONEYCOMB STRUCTURES

Takayuki Yoshikawa; Eiichi Hisada, both of Nagoya, and Tooru Hujii, Yokkaichi, all of Japan, assignors to Nippon Toki Kabushiki Kaisha (Noritake Co. Ltd.), Nagoya, Japan

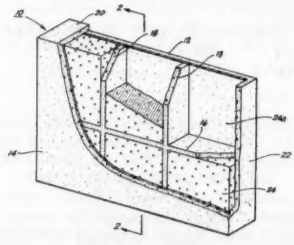
Division of Ser. No. 213,425, Dec. 29, 1971, Pat. No. 3,825,460. This application Feb. 25, 1974, Ser. No. 445,128
Claims priority, application Japan, May 18, 1971, 46-33519
Int. Cl. B32b *3/12*; B01j *11/00*; C01b *31/00*
U.S. Cl. 428—118 4 Claims

1. A thin-walled, carbonaceous, honeycomb structure having a large surface to weight ratio and used as a refractory reinforcing element, heat exchanger, catalyst or catalyst carrier, adsorbent material or the like, the honeycomb structure consisting wholly of thin-walled carbonaceous hollow cells, open at both ends for passing fluids therethrough, the honeycomb structure being made of a powdered carbonaceous material and a binder each in a carbonized state so that the particles of the carbonaceous material so carbonized are united to one another with the carbonized binder to form the carbonaceous honeycomb structure.

3,922,413
LIGHTWEIGHT, HIGH STRENGTH, REINFORCED CONCRETE CONSTRUCTIONS

Richard G. Reineman, 601 Clubhouse Ave., Newport Beach, Calif. 92660

Filed June 3, 1974, Ser. No. 475,815
Int. Cl.[2] B32B *3/12*
U.S. Cl. 428—119 21 Claims

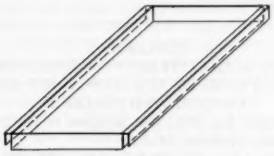


1. A relatively lightweight, high strength, cementitious construction comprising a plurality of substantially coextensive, parallel, spaced-apart membranes consisting of alternate, integrally bonded layers of fiber-reinforced epoxy resin and epoxy resin-containing concrete, said membranes being interconnected by continuous longitudinal and lateral transverse webs of epoxy resin-containing concrete so as to form a unitary structure having a plurality of enclosed cavities which are filled with cellular core material.

3,922,414
FORM COMPOSITE STRUCTURES

Keisuke Oshima; Takaya Yasumoto, both of Otsu; Michiaki Higashikuze, Takatsuki, and Masanari Kawamoto, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 30, 1973, Ser. No. 393,146
Claims priority, application Japan, Sept. 7, 1972, 47-89080
Int. Cl.² B32B *3/04, 5/18*
U.S. Cl. 428—130 **6 Claims**



1. A foam composite structure made by heating a piled up formation of alkaline silicate layer/metal sheet in which the molar ratio of alkaline silicate SiO_2/R_2O (R: Na and/or K) is 4–8, the water content of alkaline silicate is 20–170% based upon non-volatile materials, the thickness of the metal sheet is 0.05–5 mm and the linear thermal expansion coefficient of the metal sheet is 5×10^{-6}–20×10^{-6} per C°.

3,922,415
PROCESS OF TIRE RECAPPING AND CUSHION THEREFOR

Warren L. Dexter, Orinda, Calif., assignor to Electra-Bond, Inc., Livermore, Calif.

Filed Aug. 22, 1973, Ser. No. 390,388
Int. Cl.² B29H *5/04, 17/36*
U.S. Cl. 428—133 **11 Claims**

1. A method of recapping tires comprising the steps of:

attaching heating wires electrically in parallel connection between a pair of substantially parallel conducting base strips with a vulcanizable rubber layer covering the wires and part of the strips and forming a large plurality of cut-outs in the strips along the edge of said rubber layer to provide a substantially reduced area of strips at the cut-outs with the layer covering a part of the cut-outs to form a cushion element,

wrapping said cushion about a prepared tire casing,

securing new tire tread about said casing over said cushion,

applying pressure between said tread and casing, and

passing a heating current through said heating wires by connecting a power supply across said base strips to bond the tread to the casing with the cushion therebetween.

3,922,416
MEDIUM FOR RECORDING PHASE HOLOGRAMS

Robert James Ryan, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 18, 1972, Ser. No. 282,076
Int. Cl.² B29D *11/00;* **G02B** *27/22*
U.S. Cl. 428—172 **11 Claims**

1. A holographic recording medium which consists essentially of a transparent polymer substrate coated with an adherent, uniform, embossable, optically clear thermoplastic resin wherein the embossable resin is selected from the group consisting of

a. polyester-based polyurethanes;

b. polyester-based polyurethanes containing an antitacking agent;

c. linear polyesters derived from ethylene glycol, terephthalic acid, and sebacic acid, said polyesters having a molecular weight in the range between about 20,000 to about 30,000; and

d. said linear polyesters containing an anti-tacking agent, the surface of said resin having embossed thereon holographic information in the form of a three-dimensional relief pattern.

3,922,417
METHOD FOR THE MANUFACTURE OF BROAD SHEETS OF COATING MATERIAL AND APPLICATION THEREOF IN HYDRAULIC ENGINEERING

Rudolf Carlo Reintjes, De Bilt, and Albert Hollander, Hoogkerk, both of Netherlands, assignors to Bitumarin N.V., Zaltbommel and N. V. Asphalt-en Chemische Fabrieken Smid & Hollander, Hoogkerk, both of, Netherlands

Filed Oct. 3, 1972, Ser. No. 294,756
Claims priority, application Netherlands, Oct. 7, 1971, 7113751
Int. Cl.² B32b *3/02;* **B05D** *1/36, 1/18*
U.S. Cl. 428—192 **11 Claims**

1. A method for the manufacture of wide sheets of water impermeable coating material useful in hydraulic engineering which comprises

passing carrier sheet having a width in excess of 4 meters through a molten petroleum bitumen coating composition, coating said carrier sheet on both sides with said coating composition,

placing the resultant coated sheet as soon as possible onto a conveyor belt while inserting between said coated sheet and said conveyor belt a surfacing material comprising one or more paper strips and a strip of plastic film easily removed from the coated carrier sheet after cooling in a manner such that the strip of plastic film forms a lateral boundary of the surfacing material, and cooling said coated sheet,

thereby preventing said sheet from sagging toward the center to allow said molten coating composition to flow toward the center of the sheet so that the layer of coating composition at the edge of the sheet becomes too thin, and preventing said sheet from folding, while providing a sheet with an exposable margin of coating composition for bonding.

3,922,418
HEAT-SEALABLE INTERLINING FOR TEXTILE FABRICS

Alfred E. Lauchenauer, Horn, Switzerland, assignor to Raduner and Co., AG, Horn, Switzerland

Continuation-in-part of Ser. No. 82,124, Oct. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 874,041, Nov. 4, 1969, abandoned. This application July 2, 1973, Ser. No. 375,382
Int. Cl. B32b *7/14*
U.S. Cl. 428—196 **21 Claims**

20. A textile laminate comprising a textile fabric bonded to an interliner by means of a layer of resinous composition consisting essentially of a partially crosslinked thermoplastic resin derived from (1) discrete solid particles of a thermoplastic resin having a softening point between about 50° and 200°C., a Melt Flow Index of from about 20 to 50, and which upon being heated to a temperature of from about 50°C. to 200°C. does not undergo self-crosslinking but at such temperature is capable of being crosslinked by means of a crosslinking agent, said resin particles having an average particle size of from about 2 to 300 microns, and (2) a crosslinking agent for said resin, said crosslinking agent being in contact only

with the surface of said resin particles and being present in an amount sufficient to crosslink not more than about 40 percent, by weight, of said resin, said resinous composition, after being heated to said crosslinking temperature, having a Melt Index not greater than about 10.

3,922,419

MANUFACTURE OF A REINFORCED, NON-WOVEN TEXTILE FIBER SHEET MATERIAL

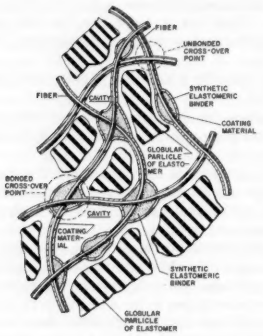
Klaus-Dieter Hammer, Mainz, and Ludwig Klenk, Hallgarten, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 291,323, Sept. 22, 1972, Pat. No. 3,853,608. This application Feb. 5, 1974, Ser. No. 439,739

Claims priority, application Germany, Sept. 24, 1971, 2147757

Int. Cl.² B32B 7/14

U.S. Cl. 428—198 **9 Claims**



1. A random fiber sheet material comprising a random fiber arrangement having a plurality of fiber cross-over points, a synthetic elastomer binder composed of an aqueous dispersion of a synthetic elastomer containing chemically reactive groups and a solution of silicone oil in toluene disposed on said fibers and bonding said fiber cross-over points in a plurality of bonded first regions of said sheet material separated by a plurality of non-bonded second regions of said sheet material having substantially no binder disposed on said fibers and said fiber cross-over points, a coating material disposed both on the surface of said binder in said bonded first regions of said sheet material and also on the surface of said fibers and fiber cross-over points in said unbonded second regions of said sheet material, said sheet material having a plurality of cavities between said coated surfaces and an elastomer material in the form of globular particles disposed in said cavities and substantially unbonded to said coating material in said bonded first and nonbonded second regions of said sheet material.

3,922,420

METHOD OF MAKING A SEMI-TRANSPARENT PHOTOMASK

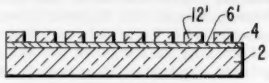
George Luther Schnable, Landsdale, Pa., and Nathan Feldstein, Kendall Park, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,094

Int. Cl.² B32B 3/10, 17/00

U.S. Cl. 428—210 **2 Claims**

1. A semitransparent photomask comprising a glass plate having disposed on a surface thereof a thin, transparent film of nickel oxide or an oxide of either a nickel-phosphorus alloy or a nickel-boron alloy and a pattern of areas of ferric oxide on said film, said ferric oxide having good light-transmission



properties in the 589 nm region but not in the ultraviolet region of the spectrum.

3,922,421

BLENDS OF ACID-CONTAINING COPOLYMERS AND COPOLYMERS OF ACRYLONITRILE AND A CONJUGATED DIOLEFIN

Harold G. Frank, Bay City, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 29, 1973, Ser. No. 327,395

Int. Cl.² B32B 7/02, 15/08, 27/32, 15/20

U.S. Cl. 428—214 **4 Claims**

1. A laminate comprising a layer of aluminum and a layer of an adhesive composition comprising an intimate mixture of between about 80 and about 98 weight percent acid-containing copolymer of ethylene and an α,β-ethylenically unsaturated carboxylic acid having between 3 and 8 carbon atoms per molecule, said acidcontaining copolymer having a melt index between about 0.5 and about 100 and containing between about 1 and about 20 weight percent of said α,β-ethylenically unsaturated carboxylic acid, and between about 2 and about 20 weight percent copolymer of acrylonitrile and a conjugated diolefin having between 4 and 8 carbon atoms per molecule, said copolymer of acrylonitrile and conjugated diolefin having a relatively low molecular weight characterized in that said copolymer will flow at ordinary room temperature and containing between about 15 and about 60 weight percent acrylonitrile and between about 40 and about 85 weight percent conjugated diolefin.

3,922,422

POLYESTER BONDED TO RUBBER AND METHOD FOR MAKING THE SAME

Richard M. Wise, Uniontown, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed June 14, 1973, Ser. No. 370,129

Int. Cl.² B29H 9/02; B60C 9/02

U.S. Cl. 428—246 **14 Claims**

1. A method for adhering a polyester reinforcing element to a rubber compound which comprises dipping said element in a first dip consisting essentially of an aqueous dispersion or suspension of a minor amount by weight of a polyallyl glycidyl-ether having a number average molecular weight of from about 400 to 650 and an average of from about 2 to 6 epoxide groups, drying said dipped element, dipping said dried polyepoxide treated element in a second dip consisting essentially of an aqueous alkaline dispersion of a minor amount by weight of a mixture of a major amount by weight of a rubbery vinyl pyridine copolymer and a minor amount by weight of a heat reactable resinous composition, drying the same, and combining said twice dipped and twice dried element with a vulcanizable rubber compound and vulcanizing the same, said heat reactable resinous composition being selected from the group consisting of

1. a substantially heat-reactable 2,6-bis(2,4-dihydroxyphenylmethyl)-4-chlorophenol composition,
2. a mixture of a heat reactable resorcinol-formaldehyde resole having hydroxyl and methylol groups and a substantially heat reactable 2,6-bis(2,4-dihydroxyphenylmethyl)-4-chlorophenol composition, and
3. a mixture of a water soluble or dispersible epoxide having from 2 to 6 epoxide groups and a molecular weight up to about 650 and an epoxide amine curing agent in an amount sufficent to cure said epoxide.

8. A bonded composite material comprising a polyester reinforcing element embedded in a vulcanized rubber, said element containing a total of from about 3 to 7% by weight (dry) based on the weight of said element of an adhesive composition consisting essentially of a first deposit of heat set polyallyl glycidyl ether having a number average molecular weight of from about 400 to 650 and an average of from about 2 to 6 epoxide groups and a second deposit of a heat set mixture of a major amount of a rubbery vinyl pyridine copolymer and a minor amount of a heat reactable resinous composition, said adhesive composition forming a bond between said element and said rubber, said heat reactable resinous composition being selected from the group consisting of

1. a substantially heat-reactable 2,6-bis(2,4-dihydroxyphenylmethyl)-4-chlorophenol composition,
2. a mixture of a heat reactable resorcinol-formaldehyde resole having hydroxyl and methylol groups and a substantially heat reactable 2,6-bis(2,4-dihydroxyphenylmethyl)-4-chlorophenol composition, and
3. a mixture of a water soluble or dispersible epoxide having from 2 to 6 epoxide groups and a molecular weight up to about 650 and an epoxide amine curing agent in an amount sufficient to cure said epoxide.

3,922,423

FLAMEPROOFING COMPOSITION FOR TEXTILE MATERIALS AND PROCESS OF MAKING AND USING SAME

Herbert Hoerster, Hofheim, Taunus, and Hans Schaffner, Boeblingen, both of Germany, assignors to Schill & Seilacher, Verwaltung GmbH, Germany

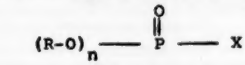
Filed May 25, 1973, Ser. No. 363,970

Claims priority, application Germany, May 25, 1972, 2225362

Int. Cl.² C09D *1/00;* **C07C** *127/00*

U.S. Cl. 428—262 **16 Claims**

14. A flame-resistant textile material retaining its flame-resistance properties on repeated laundering and dry cleaning, said textile material having applied thereto, as flameproofing agent, (A) the reaction product of a compound of the formula



in which

R is a member selected from the group consisting of alkyl and halogen substituted alkyl with 1 to 5 carbon atoms,

n is a numeral between 0.5 and 2.5, and

X is a member selected from the group consisting of hydroxyl and halogen,

with a 1,2-epihalogenohydrin and (B) an N-methylol amino compound.

3,922,424

NON-WOVEN FIBROUS MATERIAL BONDED WITH ETHYLENE/VINYL CHLORIDE INTERPOLYMERS

Harry M. Andersen, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 255,367, May 22, 1972, abandoned. This application Jan. 31, 1973, Ser. No. 328,165

Int. Cl.² D04H *1/58;* **B32B** *23/08*

U.S. Cl. 428—264 **11 Claims**

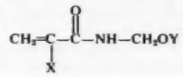
1. A bonded nonwoven fibrous product comprising nonwoven fibrous material bonded with an interpolymer consisting essentially of

A. 5 to 70% by weight based on the total weight of the interpolymer of ethylene;

B. 30 to 95% by weight based on the total weight of the interpolymer of vinyl chloride;

C. 2 to 10% by weight based on the weight of the interpolymer of acrylamide or acrylamide in combination with a polar monomer selected from the group consisting of methacrylamide; N-(alkyl) acrylamide; N-(alkyl) methacrylamide; unsaturated carboxylic acids; alkali metal salts and ammonium salts of unsaturated carboxylic acids; acrylylamides and methacrylylamides of aminoalkanoic acids; and alkyl and hydroxy alkyl esters of unsaturated carboxylic acids and

D. 2 to 10% by weight based on the total weight of the interpolymer of a compound represented by the formula



wherein X represents CH_3 or H and Y represents an alkyl group containing from 1 to 10 carbon atoms.

3,922,425

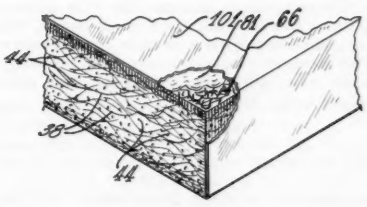
ROOFING BOARD FOR INTEGRATION IN A BUILT-UP ROOFING STRUCTURE

Leonard J. Plumberg, Kansas City, Mo., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 14, 1970, Ser. No. 72,059

Int. Cl.² E04D *5/10;* **D06N** *5/00;* **B32B** *11/04, 3/10*

U.S. Cl. 428—291 **6 Claims**



1. A roofing board haing its upper surface impregnated by asphalt and a thin, impervious polyethylene covering sheet 0.0002 to 0.001 inch thick attached over the impregnated surface, said sheet being normally tough enough to act as a parting medium preventing the board from sticking to adjacent boards when stacked for shipment and providing a clean surface for handling and installation, said covering sheet being sufficiently thin and of a composition making it easily torn or otherwise opened by the friction of application of the mopping asphalt whereby the mopping asphalt has access to and is integrated with the asphalt of the board.

3,922,426

METHOD OF MAKING FILAMENT WOUND ARTICLE

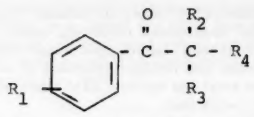
Joseph Feltzin, Wilmington, Del., assignor to ICI America Inc., Wilmington, Del.

Filed Mar. 16, 1973, Ser. No. 341,991

Int. Cl. B31c *13/00;* **B65h** *81/00*

U.S. Cl. 428—295 **10 Claims**

1. In a method of making a filament wound article from filament coated or impregnated with polyester resin matrix which comprises coating or impregnating filament with a polyester resin matrix, winding the filament around a mandrel, and curing the resin, the improvement which comprises coating or impregnating the filament with a photopolymerizable resin matrix comprising an ethylenically unsaturated polyester, an ethylenically unsaturated copolymerizable monomer, an organic peroxide, and at least one sensitizer characterized by the formula



where R_1 is —H, —Br, or —CH_3, R_2 is —H or —Br, R_3 is —H or —CH_3, and R_4 is —H or —CH_3, and wherein at least one of R_1 and R_2 is —Br, and subjecting the photopolymerizable resin to ultraviolet electromagnetic radiation to cure the resin.

3,922,427

SYNTHETIC PAPER IMPROVED WITH RESPECT TO DUSTING TROUBLE

Takashi Toyoda; Tadayuki Fukada; Masayuki Inoue, all of Ibaraki; Shigeru Takayama; Hiroshi Yui, both of Yokkaichi, and Takayuki Inoue, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Japan

Filed Dec. 12, 1974, Ser. No. 531,985

Claims priority, application Japan, Dec. 17, 1973, 48-139674

Int. Cl.² B32B *5/16, 5/26*

U.S. Cl. 428—308 **12 Claims**

1. A synthetic paper improved with respect to dusting trouble comprising a paperlike layer, of a microvoid content of at least 10 % comprising a stretched film of an olefin polymer composition with inorganic fillers mixed therein, wherein a part of said olefin polymer is an olefin polymer onto which a modifier monomer selected from the group consisting of ethylenically unsaturated carboxylic acids, their anhydrides, esters, and amides has been graft copolymerized.

3,922,428

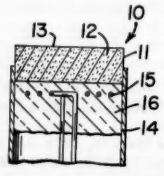
THERMIONIC CATHODE COMPRISING MIXTURE OF BARIUM OXIDE, CALCIUM OXIDE AND SAMARIUM OXIDE

Leo J. Cronin, Watsonville, Calif., assignor to Spectra-Mat, Inc., Watsonville, Calif.

Filed Feb. 4, 1972, Ser. No. 223,539

Int. Cl. H01j *1/14, 12/06*

U.S. Cl. 428—312 **8 Claims**



1. A cathode comprising:

a metallic body structure of a high melting point metal and an emission material supported by said body structure,

said emission material comprising a mixture of barium oxide, calcium oxide and samarium oxide with the amount of samarium oxide present in the mixture in excess of about 12 mol percent.

3,922,429

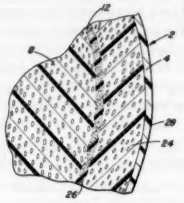
COMPOSITE IMPACT ABSORBING SAFETY STRUCTURE

John A. Welch, Cuyahoga Falls, Ohio, and Robert W. Mitchell, Brown Deer, Wis., assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 195,260, Nov. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 796,954, Feb. 6, 1969, abandoned. This application Oct. 19, 1973, Ser. No. 408,029

Int. Cl.² B32B *3/26*

U.S. Cl. 428—315 **8 Claims**



1. An impact energy absorbing safety structure such as an automobile dashboard comprising:

A. a deformable impact energy absorbing rigid expanded foam base member having a surface of selected contour;

B. a porous flexible resilient expanded foam layer member covering said impact absorbing surface; and

C. said base member and said layer member being bonded together by an intermediate tough frangible crust member adapted to initially protect said base member against deformation and adapted to break responsive to a concentrated impact force in excess of a selected force, said crust member being comprised of a composite of a selected porous portion of said layer member which porous portion is permeated by a selected portion of the expanded foam of said base member.

3,922,430

DATA BEARING CARD HAVING AN AESTHETIC, MAGNETIZABLE, COLORLESS, TRANSPARENT COATING THEREON

Simon Ernest Mayer, Lexington, Mass., assignor to Roberta B. Kuhns, Lincoln, Mass.

Filed Oct. 18, 1973, Ser. No. 407,637

Int. Cl.² H01F *10/02*

U.S. Cl. 428—325 **6 Claims**

1. A data-bearing card having a magnetizable coating composition thereon comprising a particulate, crystalline, solid reaction product of (a) about 20% to about 60% by weight of a rare earth compound containing a colorless ferromagnetic atom; (b) about 0.1% to about 5% by weight of a refractory metal oxide selected from titanium dioxide, zirconium oxide, and a mixture of both; (c) about 0.05% to about 2.5% by weight of an inorganic fluoride salt; and, (d) a balance of up to 100 weight percent of a glass forming matrix.

3,922,431

ELEMENTS FOR THIN-LAYER CHROMATOGRAPHY

Edmund Radmacher, 27 Schillingstr., and Paul Wullenweber, 36 Graner Weg, both of, 516 Duren, Germany

Continuation of Ser. No. 801,206, Feb. 20, 1969, abandoned. This application Feb. 17, 1972, Ser. No. 218,587

Int. Cl.² B01D *15/08*

U.S. Cl. 428—327 **3 Claims**

1. A thin layer chromatographic element providing a coating on a base sheet containing particles of a chromatographic sorptive substance in a form effective for thin layer chroma-

tography, wherein the improvement is characterized by said coating having been prepared and applied by intermixing a substantially homogeneous water suspension of said particles of sorptive substance with a water dispersion of discrete particles of an acrylic resin capable of undergoing cross-linking to an insoluble state, said acrylic resin particles having an average size of not over 10^{-3}mm. and being present in an amount of from 0.1 to 20% by weight of said sorptive substance, said mixing being carried out while said resin particles remain dispersed to produce a flowable mass with said sorptive substance particles and said resin particles uniformly distributed therein, and applying said flowable mass to said base sheet to form a thin layer coating thereon, said sorptive particles substantially retaining their chromatographic sorptive properties while being bound together and to said base sheet by said resin having undergone cross-linking.

3,922,432

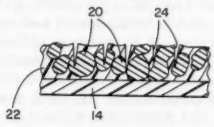
MEDIUM FOR SEPARATION PROCESSES

Donald W. Renn, Glen Cove, Maine, assignor to Marine Colloids, Inc., Rockland, Maine

Filed Feb. 1, 1973, Ser. No. 328,844

Int. Cl. B32b *9/04*; **B01k** *5/00*

U.S. Cl. 428—327 **19 Claims**



1. A thin layer medium for use in chromatographic or electrophoretic processes or radioimmunoassay procedures, said medium comprising an exposed surface layer of discrete particles of solid material containing sorbed water, said particles being of a size to pass a No. 18 screen U.S. Standard Sieve Series, said particles being bonded to a sheet of hydrated gel material, said sheet being a continuous layer formed by the gelling of an aqueous solution of gelling agent.

3,922,433

ALUMINOUS METAL WITH GLASS BEADS BONDED TO A METAL SUBSTRATE

William C. Patterson, Pittsburgh, Pa., and Charles I. Hill, Menlo Park, Calif., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 119,906, March 1, 1971, abandoned. This application June 8, 1973, Ser. No. 368,333

Int. Cl.² B32B *15/02*, *17/06*

U.S. Cl. 428—334 **1 Claim**

1. A reflective metal object having enhanced corrosion resistance and both wet and dry retro-reflection characteristics and comprising an iron or iron base alloy substrate having a 1–5 mil thickness layer of aluminum thereon formed by dipping the substrate in a molten aluminum bath and having glass beads of 1–5 mil average diameter embedded by air pressure into said aluminum layer to a depth of about 1/6 to ½ the average diameter of the beads, said beads comprising a mixture of beads having respective refractive indices of about 1.9 and about 2.1 to thereby impart reflectivity to the surface regardless of the presence or absence of a film of water thereon.

3,922,434

METHOD OF PRODUCING A TEMPORARILY PRODUCT AND PRODUCTS PRODUCED ACCORDING TO SAID METHOD

John Ivar Lindgren, Alvvagen 10, Sorberge; Per Edward Carl Udden, Hogbo, Vivsta, Timra, and Bengt Axel Wennerblow, Storgatan 15, Sundsvall, all of Sweden

Continuation of Ser. No. 876,200, Dec. 1, 1969, abandoned, Continuation of Ser. No. 643,416, June 5, 1967, abandoned. This application June 22, 1973, Ser. No. 372,503

Claims priority, application Sweden, June 17, 1966, 8317/66

Int. Cl.² D21H *1/42*

U.S. Cl. 428—342 **4 Claims**

1. A process for making a hygenic paper product temporarily waterproof and permeable to water vapors and which will disintegrate upon prolonged contact with water which comprises

adding a powder to a low wet strength paper carrier sheet material of a fiber capable of disintegration in water upon prolonged contact,

said powder being added to form in a final product a particulate layer of at least 10 g/m² on said carrier and said powder consisting essentially of a water soluble polymer which has a viscosity in a 2 % aqueous solution of at least 50 centipoises at 20°C measured with a Brookfield viscosimeter at 50 r.p.m. and selected from the group consisting of methylcellulose, ethylhydroxyethylcellulose and the sodium salt of carboxymethylcellulose.

3,922,435

HEAT TRANSFER LABEL

Benjamin Asnes, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 189,748, Oct. 15, 1971, abandoned, Continuation-in-part of Ser. No. 189,747, Oct. 15, 1971, abandoned. This application Apr. 14, 1972, Ser. No. 244,292

Int. Cl.² B32B *27/08*, *27/10*; **G09J** *07/02*

U.S. Cl. 428—349 **11 Claims**

1. A label for transferring a design print to a receiving surface, comprising

a temporary backing;

a resinous release layer upon said backing;

a transfer layer including a design print upon said resinous release layer;

and a heat-activatable adhesive layer upon said transfer layer; the bond between said release layer and said transfer layer at the transfer temperature being less than the bond formed between the adhesive layer and the receiving surface;

thereby to permit the application of said design print to said receiving surface and its immediate stripping from said release layer at the transfer temperature.

3,922,436

SILANES USEFUL AS COUPLING AGENTS AND FLAME RETARDANTS

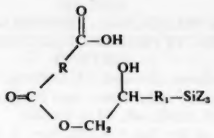
Reuben H. Bell, Cincinnati, and Kevin M. Foley, Hebron, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 13, 1974, Ser. No. 505,697

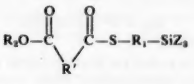
Int. Cl.² B32B *17/04*, *17/06*

U.S. Cl. 428—375 **34 Claims**

1. A compound selected from the group consisting of (1) a compound having the formula

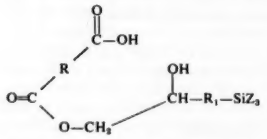


and (2) a compound of the formula

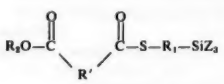


wherein R and R′ are each a divalent organic group containing 2 to 10 carbon atoms; R_1 is alkylene or alkyleneoxyalkylene, R_2 is hydrogen or alkyl and Z is selected from the group consisting of a readily hydrolyzable group and a beta-haloalkoxy group.

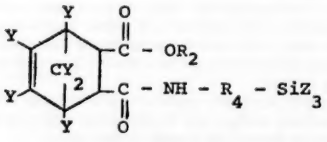
28. Glass fibers having a thin coating thereon to improve the bonding relationship between glass fibers and elastomeric or plastic resins, said coating comprising a compound selected from the group consisting of (1) a compound having the formula



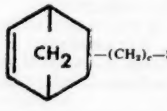
wherein R and R′ are each a divalent organic group containing 2 to 10 carbon atoms, R_1 is alkylene or alkyloxyalkylene, and Z is selected from the group consisting of a readily hydrolyzable group and a beta-chloroalkoxy group, (2) a compound of the formula



(3) a compound of the formula



wherein Y is selected from the group consisting of hydrogen, halogen, cyano and nitro, R_2 is hydrogen or alkyl and R_4 is alkylene, (4) a compound of the formula



wherein *c* is 0 or an integer from 1 to 3, (5) the halogenated derivatives of (4) and the hydrolysis products of (1) through (5).

3,922,437

STEEL MATERIAL FOR USE IN THE PRESTRESSED CONCRETE

Toshiyuki Kitta, Morioka; Shohiko Miyata, Tokyo; Tatsumi Fukunaga, Tokyo, and Mataichi Kasahara, Tokyo, all of Japan, assignors to Japanese National Railways and Oiles Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 12, 1973, Ser. No. 405,756

Claims priority, application Japan, Oct. 19, 1972, 47-103950

Int. Cl.[2] D07B *1/16*; B32B *15/08*

U.S. Cl. 428—383 **20 Claims**

1. A steel material for use in a prestressed concrete structure, said material comprising a PC-steel wire or rod, a layer of a hydrocarbon lubricating oil or wax containing thermoplastic synthetic organic resin and a thin layer of a hydrocarbon lubricating oil or wax between the said PC-steel wire or rod and the layer of the said lubricant-containing thermoplastic synthetic organic resin.

17. A method of making steel material for use in a prestressed concrete structure which comprises applying to a PC-steel wire or rod, coated with an inner layer of a synthetic organic resin, an outer layer of a thermoplastic synthetic organic resin containing a hydrocarbon lubricating oil or wax having a melting point lower than that of the synthetic organic resin of the said inner layer.

3,922,438

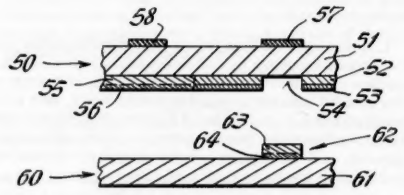
SUPERCOATED TRANSFER ELEMENTS AND PROCESS FOR PREPARING AND USING SAME

Albert E. Brown; Allan T. Schlotzhauer, and Douglas A. Newman, all of Glen Cove, N.Y., assignors to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 294,880, Oct. 4, 1972, abandoned. This application Oct. 18, 1973, Ser. No. 407,459

Int. Cl.[2] B41C *1/06*; B41M *5/02*

U.S. Cl. 428—411 **8 Claims**



1. Pressure-sensitive transfer element comprising a flexible foundation supporting a pressure-sensitive imaging layer comprising binder material and pigment and having thereon a supercoating containing a major amount by weight of a binder material comprising a pressure-exudable, normally-adhesive material and a minor amount equal to at least about 10 percent by weight, based upon the weight of the binder material, of an inert synthetic thermoplastic polymer in the form of spheres having an average sphere size within the range of from about 1 to 40 microns, said supercoating comprising said spheres present as a surface stratum over said normally-adhesive material to provide a supercoating having a surface which is slip-permitting and which is non-adhesive to the touch but which exudes said normally-adhesive material around said spheres and becomes adhesive in areas subjected to imaging pressure whereby said normally-adhesive material and corresponding underlying areas of said imaging layer transfer to a copy sheet under the effects of imaging pressure.

4. Process for producing a pressure-sensitive transfer element comprising the steps of coating a flexible foundation with an imaging composition comprising binder material and pigment to form a pressure-sensitive imaging layer and coating said imaging layer with a supercoating composition containing

a major amount by weight of the solids in the form of a binder material comprising normally=adhesive material and a minor amount by weight of the solids equal to at least about 10 percent by weight, based upon the weight of the binder material, of an inert synthetic thermoplastic polymer in the form of spheres having an average sphere size within the range of from about 1 to 40 microns to form a supercoating containing said polymer spheres as a surface stratum over said normally=adhesive material, said supercoating having a surface which is slip-permitting and which is non-adhesive to the touch but which exudes said normally=adhesive material around said polymer spheres and becomes adhesive in areas subjected to imaging pressure whereby said normally=adhesive material and corresponding underlying areas of said imaging layer transfer to a copy sheet under the effects of imaging pressure.

3,922,439
MAGNETIC RECORDING MEDIA

Hans-Joerg Hartmann, Freinsheim; Job-Werner Hartmann; Harald Frischmann, both of Ludwigshafen, and Güenter Vaeth, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 15, 1972, Ser. No. 306,674

Claims priority, application Germany, Nov. 20, 1971, 2157685

Int. Cl. H01f *10/02*

U.S. Cl. 428—425 **4 Claims**

1. A magnetic recording medium comprising a non-magnetic support and, applied thereto, a magnetic layer based on a finely divided magnetic pigment dispersed in a polyurethane-containing binder mixture, wherein the said polyurethane-containing binder mixture consists essentially of a mixture of

a. 15 to 80 parts by weight of a soluble, hydroxyl free, thermoplastic polyester urethane and prepared from an aliphatic dicarboxylic acid of 4 to 6 carbon atoms, an aliphatic diol of 3 to 10 carbon atoms and a diisocyanate of 8 to 20 carbon atoms, and

b. 20 to 85 parts by weight of a polyvinyl formal containing at least 80% by weight of vinyl formal groups.

3,922,440
SAFETY GLASS LIGHT CONTROL MEDIUM

Arthur A. Wegwerth, Maplewood, and R. Dean Lowrey, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 16, 1974, Ser. No. 497,930

Int. Cl.² B32B *17/10, 27/42, 27/30*

U.S. Cl. 428—437 **3 Claims**

1. A humidity-resistant shatter-resistant light control medium comprising a light collimating film with cellulose acetate or cellulose acetate-butyrate surfaces having bonded to those surfaces a polymeric adhesive obtained from the polymerization of monomers comprising

1. 50–80% by weight total monomer alkyl acrylate having 1 to 8 carbon atoms in the alkyl substituent and/or tetrahydrofurfuryl acrylate;

2. 20–50% of monomers further comprising

a. 0 to 50% by total weight of monomer N-alkylacrylamide and/or N-alkylmethacrylamide, wherein the alkyl groups thereof have 1 to 8 carbon atoms, and

b. 0 to 50% by total weight of monomers N-vinyl-2-pyrrolidone,

the adhesive layer further bonded to a transparent, protective covering material.

3,922,441
LITHOGRAPHIC PRINTING PLATE AND METHOD OF MAKING THE SAME

Michael J. Shaw, Portage, Mich., assignor to SCM Corporation, New York, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,528

Int. Cl.² B41C *1/10*

U.S. Cl. 428—446 **12 Claims**

1. In a lithographic printing plate comprising a base and a lithographic printing surface thereon, said printing surface comprising colloidal silica and insolubilized hydrophilic polymer, the improvement comprising; providing a positively charged colloidal silica as said colloidal silica component, wherein said silica and hydrophilic polymer are present in the weight ratio of at least about four parts silica to one part polymer.

7. A process for preparing a lithographic printing plate comprising a base and a lithographic printing surface thereon, said printing surface comprising colloidal silica and an insolubilized hydrophilic polymer, said process comprising the steps of applying to said base said colloidal silica and an insolubilizable hydrophilic polymer wherein said colloidal silica is a positively charged colloidal silica, the silica and hydrophilic polymer being present in the weight ratio of at least about four parts silica to one part polymer, and then drying said surface.

3,922,442
FLAME RETARDANT COMPOSITIONS

Joyce A. North, Somerset, N.J., and Gerard W. Kuckro, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 258,679, June 1, 1972, Pat. No. 3,832,326, which is a continuation-in-part of Ser. No. 153,120, June 14, 1971, abandoned. This application Feb. 12, 1974, Ser. No. 441,926

Int. Cl. C08f *45/04*

U.S. Cl. 428—447 **4 Claims**

1. An electrical conductor coated with a uniinsulation layer comprising a crosslinkable polymeric component containing at least 66% by weight of an ethylene-vinyl acetate copolymer, a vinyl alkoxy silane, and from 80 to 400 parts of hydrated aluminum oxide containing chemically bound water per 100 parts of the polymeric component, said vinyl alkoxy silane being present in an amount of from 0.5 to 5 parts per 100 parts of hydrated aluminum oxide.

3,922,443
PROCESS FOR COATING A SUBSTRATE WITH A POLYSILOXANE COMPOSITION

Douglas Arthur Brown, and William David Garden, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 355,732, April 30, 1973, abandoned. This application Jan. 30, 1974, Ser. No. 437,878

Claims priority, application United Kingdom, May 1, 1972, 20041/72

Int. Cl.² B05D *3/06, 3/02;* **B32B** *9/04, 9/06*

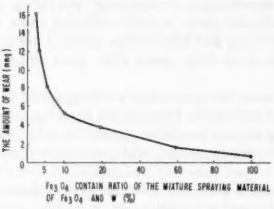
U.S. Cl. 428—447 **10 Claims**

1. A process for rendering the surfaces of substrates abhesive comprising applying to a substrate an essentially solvent-free composition consisting essentially of 80 to 99 parts by weight of a hydroxy-ended diorganopolysiloxane of viscosity not greater than 1000cP at 20°C, 1 to 20 parts by weight of an organohydrogenpolysiloxane of viscosity not greater than 100 cP at 20°C both per 100 parts by weight of total polysiloxanes and from 0.001 to 0.1 part by weight calculated as platinum, of a catalyst selected from the group consisting of complexes of halides of platinum metals with a ligand or donor group, per 100 parts by weight of total polysiloxanes and thereafter curing the coating to an abhesive film by heating.

3,922,444
SLIDING MEMBER

Yoshikatsu Nakamura, Yokohama, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed July 13, 1973, Ser. No. 378,862
Claims priority, application Japan, Aug. 30, 1972, 47-86325
Int. Cl.[2] B23P 3/00; C23C 7/00
U.S. Cl. 428—457 **4 Claims**



1. A metal sliding member having a sliding surface layer produced by spraying on a surface of a base body a mixture composed of one or more metallic materials selected from the group consisting of metal oxides, metal carbides, and self-fluxing metal alloys, with Fe_3O_4 dispersed in the one or more metallic compounds in an amount of more than 5% of the one or more metallic compounds.

3,922,445
HEAT TRANSFER PRINTING SHEET

Shogo Mizuno, Toride, and Sumio Ishii, Inaki, both of Japan, assignors to Dai Nippon Printing Company Limited, Tokyo, Japan

Filed May 18, 1973, Ser. No. 361,583
Claims priority, application Japan, May 19, 1972, 47-49136; Mar. 20, 1973, 48-31440
Int. Cl.[2] B41M 05/26, 01/12, 01/26; D06P 01/42
U.S. Cl. 428—467 **18 Claims**

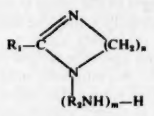
1. A heat transfer printing sheet comprising a base support sheet having formed thereon a pattern comprising a basic dye having a poor heat transferable property, and oxidizing agent which is capable of sufficiently increasing the heat transferable property of the basic dye when subjected to heating during contact with a material to which the pattern is to be transfer-printed so that only the basic dye can be transferred to said material, and a binder.

3,922,446
PROCESS OF IMPREGNATING LEATHER AND LEATHER SUBSTITUTE MATERIALS

Rudi Heyden, Hochdahl-Millrath, and Adolf Asbeck, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Oct. 6, 1972, Ser. No. 295,457
Claims priority, application Germany, Oct. 15, 1971, 2151409
Int. Cl. C14c 9/00
U.S. Cl. 428—473 **8 Claims**

1. A process for waterproofing leather or leather substitutes which comprises impregnating leather or leather substitutes with an organic solution of a salt of a high-molecular-weight hydrocarbon carboxylic acid selected from the group consisting of erucic acid and omega-phenylstearic acid and a basic nitrogen-containing heterocyclic compound selected from the group consisting of an imidazoline derivative and a pyrimidine derivative of the formula



in which R_1 is a higher hydrocarbon radical derived from a carboxylic acid selected from the group consisting of erucic acid and omega-phenylstearic acid, R_2 is an alkylene having 2 to 3 carbon atoms, m is an integer from 1 to 3, and n is an integer from 2 to 3.

3,922,447
ARTICLE COMPRISING A SUBSTRATE COATED WITH A CURED POWDER RESIN COMPOSITION COMPRISING AN AMINOPLAST AND A POLYESTER OR POLYACRYLIC RESIN

Robert A. Isaksen, Perry, Ohio; Frederic J. Locke, East Longmeadow, Mass.; John L. Smith, Springfield, Mass., and George T. Spitz, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 317,900, Dec. 26, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 456,583
Int. Cl.[2] B32B 9/02, 27/00; B05D 3/02
U.S. Cl. 428—474 **7 Claims**

1. An article of manufacture comprising a substrate coated with a film of a powder resin composition cured at a temperature in the range of 120° to 220°C. comprising:

A. from about 15 to 30 parts by weight of a condensate of a methylolamino compound, an aliphatic alcohol containing from 1 to 4 carbon atoms and a reactive compound containing at least one hydroxyl, or amide group; wherein the methylolamino compound is a methylolurea or methylolaminotriazine containing no more than one unmethylolated N-H bond per molecule, wherein the reactive compound is selected from the group consisting of aliphatic diols and polyols, aliphatic diamides and polyamides, aromatic alcohols, phenols, aromatic amides and aromatic sulfonamides, wherein the number average molecular weight of the reactive compound is less than 500, wherein at least about 50 percent of the methylol groups of the methylolamino compound have been condensed with the aliphatic alcohol or the reactive compound, wherein the molar ratio of aliphatic alcohol to methylolamino compound is at least 2, wherein the molar ratio of the methylolamino compound to the reactive compound is from about 1:0.5 to about 1:2 when the compound contains one reactive group and is from about 1:0.5 to about 1:1.5 when the compound contains 2 or more reactive groups, and wherein the glass transition temperature of the condensate is in the range of −10°C. to 100°C., and

B. from about 85 to 70 parts by weight of a polyester resin of an acrylic resin wherein the resin has a glass transition temperature in the range of from 60° to 100°C., and a number average molecular weight in the range of 500 to 25,000 and contains alcoholic hydroxyl groups, carboxyl groups or amide groups heat reactive with the condensate of the methylolamino compound, wherein the polyester has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and wherein the acrylic resin contains from 0.13 to 18 percent by weight of hydroxyl, carboxyl, and amide groups,

wherein the sintering temperature of the powder resin composition is above 40°C.

7. An article of manufacture comprising a substrate coated with a film of a powder resin composition cured at a temperature in the range of 120° to 220°C. comprising:

A. from about 15 to 30 parts by weight of a condensate of a methylolmelamine, an aliphatic alcohol containing between 1 and 4 carbon atoms and toluenesulfonamide wherein the methylolmelamine contains no more than

one unmethylolated N—H bond per molecule, wherein at least about 50 percent of the methylol groups of the methylolmelamine have been condensed with the aliphatic alcohol or para-toluenesulfonamide, wherein the molar ratio of aliphatic alcohol to methylolamino compound is at least 2, wherein the molar ratio of the methylolmelamine to para-toluenesulfonamide is between about 1:0.5 and about 1:2 and wherein the glass transition temperature of the condensate is between −10°C. and 100°C., and

B. from about 85 to 70 parts by weight of a polyester resin or an acrylic resin wherein the resin has a glass transition temperature in the range of from 60° to 100°C., and a number average molecular weight in the range of 500 to 10,000, and containing alcoholic hydroxyl groups, carboxyl groups or amide groups, heat reactive with the condensate, wherein the polyester resin has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and wherein the acrylic resin contains between 0.13 and 18 percent by weight of hydroxyl, carboxyl, or amide groups,

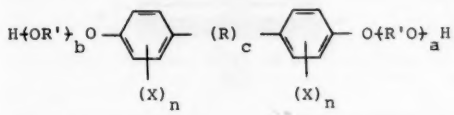
and wherein the sintering temperature of the powder resin composition is in the range of 40° to 100°C.

3,922,448
WATER-SOLUBLE POLYESTER RESIN ELECTROGRAPHIC COATINGS

Erich Kuehn, Wilmington, and John R. Wyhof, Newark, both of Del., assignors to ICI United States Inc., Wilmington, Del.

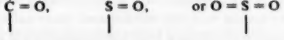
Division of Ser. No. 362,539, May 21, 1973, Pat. No. 3,865,869. This application Oct. 10, 1974, Ser. No. 513,888
Int. Cl.² D21H *1/28*; C09D *3/64*
U.S. Cl. 428—481 **12 Claims**

1. An electrographic recording element comprising a base support having coated thereon a layer of an amine salt of a polyester resin said resin comprising the reaction product of a dicarboxylic acid or an anhydride thereof, provided that at least 80 mol percent of said acid or anhydride is an alpha unsaturated dicarboxylic acid, an anhydride thereof, an aromatic dicarboxylic acid or an anhydride thereof, and a polyol blend comprising a first polyol having the following formula:



wherein

R is an alkylidene group containing from 1 to 4 carbon atoms, a cycloalkylidene group containing 5 or 6 carbon atoms, oxygen, sulfur, or a radical having one of the following formulas:



c is 0 or 1;

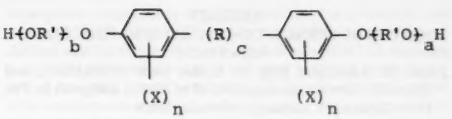
X is halogen or an alkyl radical containing from 1 to 3 carbon atoms;

n is an integer equal to from 0 to 4;

R′ is an alkylene group containing from 2 to 4 carbon atoms or the radical $CH_2CH\phi$; and

a and *b* are integers each of which is equal to at least 1 and the sum of which is equal to about 2, provided that the sum must be equal to at least 2.0

and a second polyol having the following general formula:



wherein

R, *c*, X, R′, and *n* are as defined above and *a* and *b* are integers each of which is equal to at least 1 and the sum of which is equal to from about 9 to about 16,

wherein the amount of acid or anhydride employed is sufficient to introduce from about 0.8 to about 1.2 carboxyl groups per hydroxyl group in the polyol blend and the amine has a boiling point of less than about 100°C.

3,922,449
INTERFITTING THREADED PART AND PROCESS OF PREPARING SAME

Bernard J. Bolger, Foxrock, Ireland, assignor to Loctite (Ireland), Limited, Dublin, Ireland

Filed Nov. 26, 1973, Ser. No. 419,015
Int. Cl.² F16B *39/00*; C09J *3/14*
U.S. Cl. 428—542 **9 Claims**

1. Interfitting threaded part having on the engagement area thereof a first coating of an anaerobic composition comprising a polymerizable acrylate ester monomer and a peroxy polymerization initiator therefor, and over said first coating a second coating of a cyanoacrylate ester polymer.

5. The process of preparing an interfitting part having a curable adhesive coating thereon which comprises: (a) applying to the engagement area of said part a curable anaerobic composition comprising a polymerizable acrylate ester monomer and a peroxy polymerization initiator; (b) applying over said coating of anaerobic composition a film of a curable cyanoacrylate ester monomer; and (c) allowing said cyanoacrylate ester to polymerize and form a film of cured cyanoacrylate polymer over said anaerobic composition.

3,922,450
COATED GLASS CONTAINER AND METHOD FOR COATING SAME

Edward J. Stengle, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 28, 1973, Ser. No. 374,539
Int. Cl.² B32B *17/06*; C03C *17/32*
U.S. Cl. 428—35 **14 Claims**

1. A glass container having a thin layer of polyethylene thereon, said polyethylene layer having adhered to the exterior portion thereof a tough, resilient, flexible, continuous film of a thermoplastic ionic resin, said film being capable of retaining broken glass fragments upon fracture of said container, said ionic resin comprising a carboxy copolymer of an alpha olefin monomer and an alpha, beta ethylenically unsaturated carboxylic acid, said copolymer containing about 5% to about 25% by weight of copolymerized carboxylic acid, said copolymer containing ionized carboxylic acid groups resulting from the neutralization of about 5% to about 70% of said carboxylic acid groups with a cation selected from K^+, Na^+, Zn^{++}, Ca^{++}, and NH_4^+, said film being so loosely adhered that it can be integrally peeled from the container without leaving film residue.

3,922,451
COATED BEVERAGE CONTAINER AND PROCESS OF COATING

James E. Anschutz; Dale S. Gibbs, both of Midland, and Harold J. Townsend, Saginaw, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 6, 1973, Ser. No. 422,375
Int. Cl.² B32B *27/06, 27/30*
U.S. Cl. 428—35 8 Claims

1. A process for applying a substantially blush-free, self-adherent protective coating on the beverage contacting surfaces of a substantially rigid beverage container, said process comprising

1. coating said surfaces with a continuous coating of a vinylidene chloride interpolymer in latex form wherein said interpolymer when in the form of a dried coating has a clearly distinguishable endotherm between about 100°C. and 200°C. as measured by differential thermal analysis, said endotherm indicating a crystalline melting point, said interpolymer consisting essentially of (a) from about 85 and 93 parts by weight of vinylidene chloride, (b) up to about 10 parts by weight of a comonomer selected from the group consisting of acrylonitrile, methacrylonitrile, methyl acrylate, ethyl acrylate, propyl and isopropyl acrylate, butyl and isobutyl acrylate, hexyl acrylate and 2-ethylhexyl acrylate and the corresponding methacrylate derivatives, (c) at least 3 but less than 15 parts by weight of a hydrophilic adhesion promoting comonomer selected from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide, N-methylol acrylamide, N-methylol methacrylamide, diacetone acrylamide, hydroxymethyldiacetone acrylamide, hydroxyethylacrylate and hydroxypropylacrylate, and (d) up to about 1.5 parts by weight of a copolymerizable emulsifier selected from the group of sulfonic acids and their salts having the formula

$$R-Z-Q-SO_3^-M^+$$

wherein the radical R is selected from the group consisting of vinyl and alpha substituted vinyl; the symbol Z represents a difunctional linking group which will activate the double bond in the vinyl group; -Q- is a divalent hydrocarbon having its valence bonds of different carbon atoms; and the synbol M^+ represents a cation, said interpolymers being prepared by the substantially continuous addition polymerization of its monomeric components in aqueous dispersion, then

2. subjecting said coating to a temperature of at least about 110°C. but below the decomposition temperature of said coating for a period sufficient to form a substantially continuous, adherent, nonporous, nonblushing layer composed of the dried residues of said latex.

5. A beverage container having the beverage contacting surfaces thereof coated by the process of claim 1.

3,922,452
MICROWAVE BROWNING VESSEL

Ray B. Forker, Jr., Horseheads, and Joseph N. Panzarino, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,896
Int. Cl.² B65D *1/00*
U.S. Cl. 428—35 3 Claims

1. A microwave browning vessel demonstrating improved detergent durability and increased service life consisting of a glass-ceramic vessel having on at least a portion of the surface thereof an electrically conductive film consisting at least predominately of tin oxide, said glass-ceramic vessel being formed of a glass-ceramic material which exhibits a weight loss due to acid leaching of less than about 0.2 milligrams of material per square centimeter of leached surface area upon exposure of the leached surface area to an aqueous 5 weight percent solution of hydrochloric acid at 95°C. for 24 hours.

3,922,453
HAND RAIL CONSTRUCTION

Robert F. Seery, Oak Brook, Ill., assignor to Julius Blum & Co., Inc., Carlstadt, N.J.

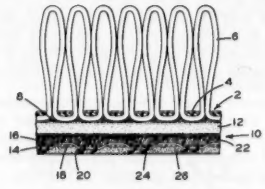
Filed May 17, 1974, Ser. No. 470,738
Int. Cl.² B32B *3/10*
U.S. Cl. 428—44 1 Claim

1. As a new article of manufacture, an elongated, laminated hand rail structure comprising a plurality of elongated, side-by-side disposed laminae, each of said laminae being comprised of separate, elongated, resin impregnated wood module sections butt-joint connected in end-to-end relation, adjacent laminae being adhesively connected at their interface, said hand rail being characterized by said wood module sections being resin impregnated prior to the formation of said adhesive connection between laminae, and by the butt joint connections between the modules forming adjacent said laminae when assembled into said hand rail being offset in a longitudinal direction one from the other, thereby to define a molding structure having a high degree of resistance to transverse stress as a result of solid portions of adjacent modules reinforcing the said butt joint connections, said molding, in addition, having an improved appearance as a result of the regular thickness of adhesive lines of connection defined between adjacent said laminae.

3,922,454
SECONDARY BACKING FOR CARPETING

Robert F. Roecker, Willow Street, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 29, 1974, Ser. No. 527,952
Int. Cl.² D05C *17/02*
U.S. Cl. 428—95 3 Claims



2. A carpet structure comprising in combination: a carpet material consisting of a primary scrim having tufted thereinto a fibrous material with loops extending above the primary scrim to form the carpet face, the carpet face fibrous material extends partly to the opposite side of the primary scrim and an adhesive layer bonds this last-mentioned material to the primary scrim, and, a secondary backing comprising a secondary scrim and a fiber facing needle bonded to the top surface thereof, an adhesive layer bonding the secondary backing to the carpet material with the fiber facing on the secondary scrim being sandwiched in between the primary scrim of the carpet material and the secondary scrim and in engagement with the adhesive layer which is bonding the secondary backing to the carpet material, and said fiber facing having some fiber needled through the secondary scrim with this fiber being encapsulated in an adhesive and being inclined and flattened against the bottom of the secondary scrim.

3,922,455

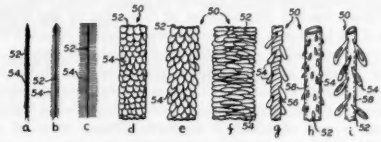
LINEAR ELEMENT WITH GRAFTED NIBS AND METHOD THEREFOR

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., Montclair, N.J.

Continuation of Ser. No. 256,068, May 23, 1972, abandoned. This application Sept. 26, 1973, Ser. No. 401,084

Int. Cl.[2] A44B *17/00*

U.S. Cl. 428—85 1 Claim



1. Self-gripping device comprising a multiplicity of gripping elements stiffly attached in an upright fashion to a base and distributed over substantially the entire surface area thereof, said gripping elements comprising discrete lengths of a linear member having physically bonded thereto in relatively thick profusion a plurality of scales rounded at one end and bonded at the other end to said linear member with the ronded ends pointing down towards said base, said scales being bonded to said linear member in overlapping relation to one another so as to substantially completely cover said linear member, said gripping elements being adapted to penetrate and become lodged in a receiving material.

3,922,456

POLYVINYL BUTYRAL COMPOSITE INTERLAYER FOR LAMINATED SAFETY GLASS

Donald B. Baldridge, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 27, 1973, Ser. No. 355,364

Int. Cl.[2] B32B *3/00*

U.S. Cl. 428—203 6 Claims

1. A plasticized polyvinyl butyral composite interlayer for laminated safety glass wherein the polyvinyl butyral interlayer comprises at least two sheets of plasticized polyvinyl butyral combined together wherein at least a portion of one of the sheets of polyvinyl butyral is printed with an ink to form a gradient color band wherein the printed side of the sheet is in face-to-face contact with another sheet of polyvinyl butyral.

3,922,457

DRY WIPE WRITING SYSTEM AND INK THEREFOR

George Derrick Barnwell, Harrogate, and Reginald Charles Peter, Uxbridge, both of England, assignors to Stratabord Limited, Harrogate, England

Filed Dec. 19, 1973, Ser. No. 426,105

Int. Cl.[2] B32B *3/10*

U.S. Cl. 428—207 13 Claims

1. A dry-wipe writing system comprising a writing surface which is a sheet of a polyfluorocarbon polymer selected from the group consisting of polytetrafluoroethylene, fluoroethylene propylene copolymer and ethylenetetrafluoroethylene copolymer; a support to which the said sheet is laminated; and a resin-bodied solvent ink on the said writing surface in any desired configuration, the resin-bodied solvent ink comprising a volatile, organic solvent, a coloring material which is selected from the group consisting of dyestuffs, in combination with an inorganic salt, and pigments, and a resin selected from the group consisting of phenol-formaldehyde novolacs, alkoxy-alkylated nylons and vinyl resins, which, together with the coloring material, forms, when dry, an amorphous, granular, brittle film wipably removably adherent to the writing surface.

3,922,458

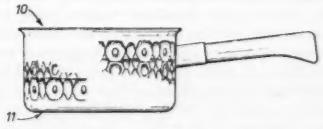
VITREOUS ENAMELLING

Francis Bernard Lynch, Radyr, Great Britain, assignor to Curran Oils Limited, Cardiff, Great Britain

Filed Nov. 29, 1973, Ser. No. 420,237

Int. Cl.[2] C23D *5/06, 08*

U.S. Cl. 428—210 11 Claims



1. A method of vitreous-enamel decorating of an object formed of de-carbonized or low carbon steel, comprising the steps of; applying a first coating of enamel having a first melting temperature, heating said first coating of enamel to said first melting temperature to fuse said enamel to the object, applying in a controlled pattern a second coating of enamel over said first coating, said second coating of enamel having a second melting temperature different from said first melting temperature, heating said second coating of enamel to a fusing temperature to cause said first and second coatings of enamel to become flowable and timing said fusing temperature until there is physical movement of the two enamels relative to the object being coated thereby forming a surface having a relief raised effect conforming substantially to said controlled pattern.

3,922,459

PROCESS FOR THE MANUFACTURE OF FLAME-RESISTANT LAMINATES

Arnold Franz, Troisdorf-Spich, and Werner Stein, Troisdorf-Kriegsdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Aug. 23, 1972, Ser. No. 283,247

Claims priority, application Germany, Aug. 27, 1971, 2142890; May 26, 1972, 2225587

Int. Cl. C09d *1/00*

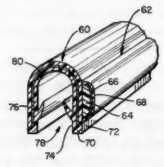
U.S. Cl. 428—297 5 Claims

1. A formed substrate comprised of a web of fibers, which substrate is coated with a coating of a synthetic resin, which coating contains pentabromodiphenyl ether, said synthetic resin being a condensation polymer of formaldehyde with cresol or phenol formed under alkaline conditions, said pentabromodiphenyl ether being present in an amount of between 0.5 and 15 weight percent based on the weight of said web.

3,922,460
GASKET WITH PLASTIC MOLDING

Norman C. Jackson, Sheffield Lake, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Filed Apr. 26, 1971, Ser. No. 137,708
Int. Cl.² B32B 7/02
U.S. Cl. 428—217 3 Claims



1. A strip structure comprising a vinyl base portion having an outer surface, and a vinyl trim portion heat sealed to said outer surface of said base portion and having an outer surface, a film of transparent polyethylene terephthalate bonded to and having a metallized surface facing said outer surface of said trim portion, said metallized surface being subject to disfiguration upon bending of said strip structure, said vinyl of said trim portion having a Durometer hardness of from 85 to 99 on the Shore A scale, 15 second delay method to prevent disfiguration of said metallized surface upon bending of said strip structure, and said vinyl of said base portion having a Durometer hardness of from 50 to 80 on the Shore A scale, 15 second delay method.

3,922,461
ACID-MODIFIED POLY(VINYL ACETATE-VINYL PROPIONATE) TEXTILE SIZES

Albert E. Corey, East Longmeadow, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 363,903, May 25, 1973, Pat. No. 3,860,553, which is a division of Ser. No. 186,441, Oct. 4, 1971, Pat. No. 3,759,858. This application Dec. 6, 1974, Ser. No. 530,241
Int. Cl.² D06B 9/00; D06C 29/00
U.S. Cl. 428—265 6 Claims

1. Sized textile materials wherein the size is the interpolymerization product of from 50 to 92 percent by weight of vinyl acetate, from 5 to 40 percent by weight of vinyl propionate and from 3 to 10 percent by weight of an ethylenically unsaturated carboxylic acid containing from 3 to 9 carbon atoms; wherein the percent by weight is based on the total weight of monomers.

3,922,462
ABSORBENT NONWOVEN FABRICS

Howard Katz, Hightstown, and Stuart H. Ganslaw, Piscataway, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 10, 1974, Ser. No. 459,465
Int. Cl.² D06N 7/06
U.S. Cl. 428—290 12 Claims

1. An absorbent nonwoven fabric consisting essentially of
a. a web of fibers,
b. about 5.0 to about 100 weight percent, based on the fibers, of crosslinkable binder, and
c. about 0.2 to about 10.0 weight percent, based on said fibers and binder, of at least one surfactant consisting of at least one salt of a bis-alkyl sulfosuccinate having alkyl substituents each alkyl containing 13–14 carbon atoms.

3,922,463
PAPER MATERIAL FOR PRESSURE SENSITIVE RECORDING SYSTEM

Takashi Masaoka, Hyogo; Noritoshi Watanabe, Osaka; Yasuo Takegawa, and Tojiro Kitahori, both of Hyogo, all of Japan, assignors to Kanzaki Paper Mfg. Co. Ltd., Tokyo, Japan

Filed July 19, 1973, Ser. No. 380,662
Claims priority, application Japan, July 21, 1972, 47-73524
Int. Cl.² B41C 1/06; B41M 5/16
U.S. Cl. 428—323 16 Claims

1. A pressure sensitive recording paper comprising a support sheet having, disposed on at least one of the surfaces thereof, at least one color producing reactant selected from the group consisting of a colorless dye material which is dissolved in an oil and contained in microcapsules and a color acceptor reactive with said colorless dye material to produce a color image, said support sheet comprising fibrous material, at least a part of which is synthetic fibrous material, said synthetic fibrous material being selected from the group consisting of (1) synthetic fibers made of an alpha-olefin polymer or copolymer; (2) synthetic fibers made of a mixture of an alpha-olefin polymer or copolymer with another blendable polymer; (3) synthetic fibers having at least 60% by weight of vinyl alcohol unit; (4) modified synthetic fibers obtained by carrying out polymerization of at least vinyl monomer on or in natural cellulose fibers; and (5) modified synthetic fibers obtained by depositing an alpha-olefin polymer or copolymer on natural or synthetic fibers, and said support sheet having a coefficient of tetralin penetration rate of 600×10^{-3} cm/min$^{1/2}$ or less, said coefficient of tetralin penetration rate being represented by K in the following formula:

$$h(\text{cm}) = K\sqrt{t\ (\text{min})}$$

wherein h is a length by cm of tetralin penetration and t is time by minute.

3,922,464
REMOVABLE PRESSURE-SENSITIVE ADHESIVE SHEET MATERIAL

Spencer F. Silver, White Bear Lake; Louis E. Winslow, Stillwater, and Alvin R. Zigman, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 257,240, May 26, 1972, abandoned. This application Feb. 6, 1973, Ser. No. 330,016
Int. Cl.² C09J 7/04
U.S. Cl. 428—355 10 Claims

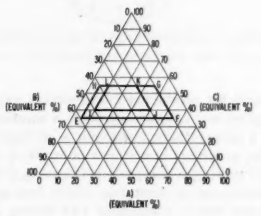
1. In adhesive-coated sheet material comprising in combination a self-sustaining backing sheet having a layer of normally tacky and pressure-sensitive adhesive bonded to at least one face thereof,
the improvement which comprises using as said adhesive a copolymer of monomers consisting essentially of
a. from 88 to 99 parts by weight of at least one terminally unsaturated vinyl monomer, 70 to 100 weight percent of said vinyl monomer being selected from the class of non-tertiary alkyl acrylates wherein each alkyl group has at least half of its carbon atoms in a single chain and the average length of the alkyl chain is more than 4 and not more than 12,
b. from 0.2 to 5 parts by weight of at least one vinyl-unsaturated, homopolymerizable emulsifier monomer which is a surfactant having both a hydrophobic and a hydrophilic moiety, contains at least 5 but not more than 40 carbon atoms and is nonionic and/or water-dispersible, and
c. from 0 to 10 parts by weight of at least one zwitterion monomer having a free radically polymerizable unsaturated group,
the total parts by weight of (b) plus (c) being at least 1 and not more than 12, and the total parts by weight of (a) plus (b) plus (c) being 100,
whereby said adhesive-coated sheet material can be suffi-

ciently firmly adhered to enameled or lacquered surfaces to satisfy the requirements of a masking tape and removed cleanly therefrom, even after exposure to heat, for example, 250°F. for 1 hour, and light.

3,922,465
SOLDERABLE AND THERMOSTABLE INSULATED WIRES

Munetake Kawaguchi, and Hirohiko Nakabayashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 28, 1974, Ser. No. 437,083
Claims priority, application Japan, Jan. 26, 1973, 48-11377
Int. Cl.² H01B *3/30*; C08G *73/10*
U.S. Cl. 428—383 **2 Claims**



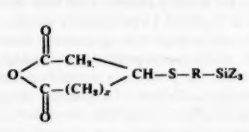
1. A solderable and thermostable insulated wire which comprises an insulating layer as an under layer which is formed by applying a polyester-imide wire enamel which includes polyester-imide or polyesteramide-imide and has 5-membered imide groups and ester bonds in the molecule to a conductor and baking, wherein said polyester-imide wire enamel mainly comprises the reaction product of (A) a dibasic carboxylic acid free of a 5-membered imide ring, a derivative thereof or a mixture thereof, (B) a dibasic carboxylic acid which has at least one 5-membered imide ring, a derivative thereof or a mixture thereof, (C) a tri- and/or higher-hydric aliphatic alcohol and (D) a dihydric alcohol, the equivalent proportions and said components (A), (B), and (C) being 10 to 40 equivalents % for said component (A), 20 to 50 equivalent % for said component (B) and 40 to 55 equivalent % for said component (C), and an insulated layer as an over layer which is formed by applying a polyimide wire enamel or a polyamide-imide wire enamel to said under layer and baking.

3,922,466
SILANE COUPLING AGENTS

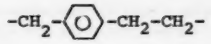
Reuben H. Bell, Cincinnati, and Kevin M. Foley, Hebron, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 16, 1974, Ser. No. 506,668
Int. Cl.² B32B *9/00*, *15/00*
U.S. Cl. 428—388 **29 Claims**

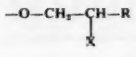
1. A compound of the formula:



wherein x is 0 or an integer from 1 to 2, R is C_3 to C_8 alkylene or a group

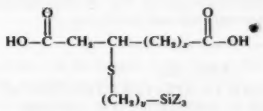


and Z is a group selected from the group consisting of a C_1 to C_4 alkoxy group and a halo-alkoxy group of the formula:

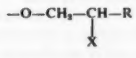


wherein X is halogen and R is hydrogen or C_1 to C_3 alkyl.

7. A compound of the formula:

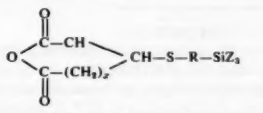


wherein x is 0 or an integer from 1 to 2 and Z is a group selected from the group consisting of a C_1 to C_4 alkoxy group and a halo-alkoxy group of the formula:

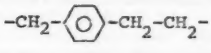


wherein X is halogen and R is hydrogen or C_1 to C_3 alkyl.

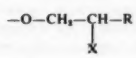
21. Glass fibers having a thin coating thereon to improve the bonding relationship between glass fibers and elastomeric materials or plastic resins, said coating formed from a compound of the formula:



wherein x is 0 or an integer from 1 to 2, R is C_3 to C_8 alkylene or a group



and Z is a group selected from the group consisting of a C_1 to C_4 alkoxy group and a halo-alkoxy group of the formula:



wherein X is halogen and R is hydrogen or C_1 to C_3 alkyl.

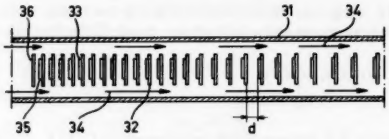
3,922,467
VAPOUR-PHASE DEPOSITION METHOD

Pierre Pinchon, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 26, 1974, Ser. No. 464,574
Claims priority, application France, Apr. 27, 1973, 73.15461
Int. Cl.² C23C *11/00*
U.S. Cl. 428—411 **6 Claims**

1. A method of forming a deposit on a large number of flat substrates by reaction of a gaseous mixture of compounds of the elements to be deposited, said method comprising passing a gas flow containing gaseous compounds of the elements to be deposited through the zone of a tubular space containing the substrates arranged with their flat surfaces substantially perpendicular to the direction of the gas flow and each sub-

strate being separated from the next substrate by a distance that increases in the direction of the flow of the gas, said gas



being heated to a temperature above that of said substrates and depositing said elements on said substrates.

3,922,468

FIBER-ELASTOMER LAMINATES UTILIZING AN UNRESINIFIED M-AMINOPHENOL PRIMER

Oliver W. Burke, Jr., Fort Lauderdale, and Barbara P. Hunt, Pompano Beach, both of Fla., assignors to Oliver W. Burke, Jr., Fort Lauderdale, Fla.

Filed Jan. 19, 1972, Ser. No. 219,173

Int. Cl.² B32B *25/02, 27/38, 27/42;* **C09J** *5/02*

U.S. Cl. 428—414 **27 Claims**

1. In the formation of a bond by vulcanizing a vulcanizable elastomer to a fibrous material with the aid of an adhesive dip of phenoplast dried on the fibrous material before assembly with the elastomer and vulcanization thereof, the improvement which comprises also applying to the fibrous material, and drying thereon before such assembly, a dip of unresinified m-aminophenol.

3,922,469

COMPOSITE LAMINATE ADHESIVELY BONDED WITH A HOT MELT COMPOSITION

John W. Bayer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 336,769, Feb. 28, 1973, abandoned, which is a division of Ser. No. 156,693, June 25, 1971, Pat. No. 3,749,630. This application Mar. 25, 1974, Ser. No. 454,241

Int. Cl.² B32B *27/40*

U.S. Cl. 428—424 **2 Claims**

1. In a laminated article comprising two juxtaposed lamina of relatively impervious materials, wherein one of said lamina is polyethylene, and hot melt adhesive means disposed intermediate said lamina for bonding said lamina to each other, the improvement wherein said adhesive means is a crystalline, creep-resistant composition having a tensile shear strength of about 75 to 140 pounds per 1 inch by ½ inch lap, said composition being the polymeric product of the condensation of a monomer mixture consisting essentially of

a. a compound of the formula

wherein R is a saturated aliphatic hydrocarbon radical of 4 to 10 carbon atoms and

b. a compound of the formula NH_2—R′—OH wherein R′ is a saturated aliphatic hydrocarbon radical of 2 to 6 carbon atoms or a mixture of 70 to 99 mole percent of a compound of the formula NH_2—R′—OH wherein R′ is a saturated aliphatic hydrocarbon radical of 2 to 6 carbon atoms with 1 to 30 mole percent of a compound of the formula NH_2—R″—NH_2 wherein R″ is a saturated aliphatic hydrocarbon radical of 2 to 6 carbon atoms or a symmetrical alicyclic hydrocarbon radical of 8 carbon atoms, and having a molecular weight of about 2000 to 7000, the compound of (a) being a stoichiometric amount to 7.0 mole percent excess.

3,922,470

PROCESS FOR PRODUCING MICROPOROUS VAPOR-PERMEABLE FILM OR SHEET

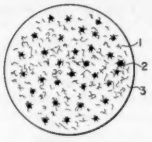
Masahiro Amano, and Takashi Koike, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

Filed Oct. 10, 1973, Ser. No. 405,080

Claims priority, application Japan, Oct. 11, 1972, 47-101741

Int. Cl.² B05B *5/00;* **B32B** *27/40*

U.S. Cl. 428—425 **19 Claims**



1. A process for producing microporous, vapor-permeable film or sheet by wet coagulation from a solution of polymers comprising a polyurethane elastomer as at least 50 percent by weight of the polymers in solution comprising adding to said solution with stirring, a compound (I) having at least two basic nitrogen atoms and at least two active hydrogen atoms attached thereto and a compound (II) having at least three NCO-groups; or a compound (III) having at least two basic nitrogen atoms and at least three active hydrogen atoms attached thereto and a compound (IV) having at least two NCO-groups, thereby immediately reacting the compound (I) with the compound (II) or reacting the compound (III) with the compound (IV) to prepare a dispersion of colloid particles having contained therein said polymers comprising a polyurethane elastomer, impregnating a substrate with said dispersion or coating said dispersion on a substrate, the coagulating said dispersion and then removing the coagulating liquid, the molar ratio in the reaction between said compound I and compound II and between said compound III and compound IV being NH/NCO 1.

3,922,471

SURFACE HAVING SEALING GLASS COMPOSITION THEREON

James L. Ellis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 277,457, June 19, 1972, Pat. No. 3,888,686, which is a continuation of Ser. No. 831,648, June 9, 1969, abandoned. This application Apr. 1, 1974, Ser. No. 456,682

Int. Cl.² B32B *17/06*

U.S. Cl. 428—427 **5 Claims**

1. A composite article comprising at least one preformed surface of a material selected from at least one of the group of glass, ceramic, metal and metallic alloy and having a fusion-type sealing composition thereon consisting essentially of a base sealing glass having a sealing temperature below the deformation temperature of said preformed surface and being selected from the group consisting essentially of lead-zinc-borate and lead-borosilicate sealing glasses, said base sealing glass having from about 2 to about 18 percent by weight of a calcined zirconia vanadia silicia stain homogeneously blended therein, said fusion-type sealing composition possessing the property of being devitrifiable to produce a devitrified fusion-type seal having a thermal coefficient of expansion ranging from about 5×10^{-7} in./in./°C. (0°–300°C.) to 20×10^{-7} in./in./°C. (0°–300°C.) lower than the same sealing glass composition would possess upon being devitrified without any zirconia vanadia silica stain being blended therein.

3,922,472
GLASS FIBER REINFORCED ELASTOMERS

Kevin M. Foley, Hebron, and Frank P. McCombs, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 13, 1974, Ser. No. 523,387
Int. Cl.² B32B *17/06*
U.S. Cl. 428—429 **26 Claims**

1. A size composition for use in the treatment of glass fibers comprising an aqueous dispersion of (1) a film-forming material, (2) a polyamino silane having the formula

$$H_2N\text{-}(CH_2\text{-}CH_2\text{-}N)_x\text{-}(CH_2\text{-}CH_2\text{-}NH)_z\text{-}[CH_2\text{-}CH_2\text{-}CH_2\text{-}Si(OR)_3]_{3-z}$$

$$\begin{array}{l} CH_2 \\ | \\ CH_2 \\ | \\ \text{-N-}[CH_2\text{-}CH_2\text{-}CH_2\text{-}Si(OR)_3]_z \end{array}$$

wherein R is alkyl, x is an integer between 0 and 2, and y and z are integers or its hydrolysis products and (3) a salt having the formula

$$\left[H_2N\text{—}(CH_2)_n\text{—}\overset{\displaystyle O^-}{\underset{\displaystyle O^-}{\overset{|}{\underset{|}{Si}}}}\text{—}O^- \right]_a M$$

wherein n is an integer from 3 to 6, M is a metal and a is ⅔ or ½.

11. Glass fibers having a thin film coating thereon, said coating comprising (1) a film-forming material, (2) a polyamino silane having the formula

$$H_2N\text{-}(CH_2\text{-}CH_2\text{-}N)_x\text{-}(CH_2\text{-}CH_2\text{-}NH)_z\text{-}[CH_2\text{-}CH_2\text{-}CH_2\text{-}Si(OR)_3]_{3-z}$$

$$\begin{array}{l} CH_2 \\ | \\ CH_2 \\ | \\ \text{-N-}[CH_2\text{-}CH_2\text{-}CH_2\text{-}Si(OR)_3]_z \end{array}$$

wherein R is alkyl, x is an integer between 0 and 2, and y and z are integers or its hydrolysis products and (3) a salt having the formula

$$\left[H_2N\text{—}(CH_2)_n\text{—}\overset{\displaystyle O^-}{\underset{\displaystyle O^-}{\overset{|}{\underset{|}{Si}}}}\text{—}O^- \right]_a M$$

wherein n is an integer from 3 to 6, M is a metal and a is ⅔ or ½.

18. A glass fiber bundle comprising a plurality of glass fibers, each of the glass fibers having a thin film coating thereon, said coating comprising (1) a film-forming material, (2) a polyamino silane having the formula

$$H_2N\text{-}(CH_2\text{-}CH_2\text{-}N)_x\text{-}(CH_2\text{-}CH_2\text{-}NH)_z\text{-}[CH_2\text{-}CH_2\text{-}CH_2\text{-}Si(OR)_3]_{3-z}$$

$$\begin{array}{l} CH_2 \\ | \\ CH_2 \\ | \\ \text{-N-}[CH_2\text{-}CH_2\text{-}CH_2\text{-}Si(OR)_3]_z \end{array}$$

wherein R is alkyl, x is an integer between 0 and 2, and y and z are integers or its hydrolysis products and (3) a salt having the formula

$$\left[H_2N\text{—}(CH_2)_n\text{—}\overset{\displaystyle O^-}{\underset{\displaystyle O^-}{\overset{|}{\underset{|}{Si}}}}\text{—}O^- \right]_a M$$

wherein n is an integer from 3 to 6, M is a metal and a is ⅔ or ½, and an impregnant in the bundle, said impregnant comprising as the essential component a resin selected from the group consisting of a phenol-aldehyde resin and a resorcinol-aldehyde resin.

3,922,473
LAMINATED FILM

Yujiro Kosaka; Masaru Uemura; Tokio Fujiki, and Mitsutaka Saito, all of Shin Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Oct. 2, 1973, Ser. No. 402,916. The portion of the term of this patent subsequent to July 31, 1990, has been disclaimed.
Claims priority, application Japan, Oct. 11, 1972, 47-10123
Int. Cl.² C09J *3/14;* **B32B** *27/30*
U.S. Cl. 428—463 **7 Claims**

1. A laminated film which comprises:

a film substrate wherein said film substrate is aluminum foil, biaxially stretched polypropylene film, unstretched polypropylene film, polyester film, polyamide film, polyethylene film, cellophane, polyvinylchloride or kraft paper and wherein said top film is polyethylene, polypropylene, an ethylene-vinylacetate copolymer or an ethylenepropylene copolymer; an adhesive undercoat of a carboxylated ethylene copolymer composition prepared by copolymerizing a monomer mixture of an α,β-unsaturated carboxylic acid or anhydride and at least one vinylidene monomer of the formula

$$CH_2=C\begin{matrix} X \\ \diagdown \\ \diagup \\ Y \end{matrix}$$

wherein X and Y are the same or different and each represents hydrogen, chlorine, a lower alkyl group containing 1 – 6 carbon atoms, acetoxy, or a carboxylic ester group in the presence of an ethylene-vinylacetate copolymer, wherein the ratio of said monomer mixture to said ethylenevinylacetate copolymer is 1~80 : 99~20 parts by weight and the ratio of said α,β-unsaturated carboxylic acid or anhydride to said vinylidene monomer is 1 : 0.1~10, wherein said ethylene-vinylacetate copolymer contains 5–70 wt percent of a vinylacetate component and has a melt index of 0.1 – 500 g/10 min, applied to said film substrate; and a top film of a polyolefin or ethylene copolymer applied to said adhesive undercoat.

3,922,474

COLD-PRESSED REFRACTORY MATERIALS

Clifford Gordon Brown, Fetcham, England, assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 263,967, June 19, 1972, abandoned. This application Nov. 29, 1973, Ser. No. 420,329
Claims priority, application United Kingdom, July 1, 1971, 30844/71
Int. Cl.² C23C *13/02*
U.S. Cl. 428—457 4 Claims

1. A cold-pressed, non-sintered boron-containing refractory body which is impregnated throughout with a material selected from the group consisting of manganese, silicon, chromium, iron, cobalt, and nickel, said impregnated body having a low residual porosity and increased density and hardness, wherein said boron-containing refractory is selected from the group consisting of boron-metal compounds of metals of Groups IIA, IIIA, IVA, VA, and VIA of the Periodic Table.

3,922,475

PROCESS FOR PRODUCING NITRIDE FILMS

Harold M. Manasevit, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

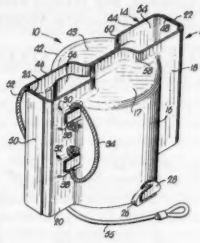
Filed June 22, 1970, Ser. No. 48,558
Int. Cl.² B32B *9/04*; B01D *7/02*; B01J *17/32*
U.S. Cl. 428—539 3 Claims

1. A structure comprising
a single crystal sapphire substrate having a (0112) orientation, and
a single crystal layer of a compound taken from the group consisting of aluminum nitride, boron nitride, gallium nitride and indium nitride having a (1120) orientation.

3,922,476
LIVE LINE POLE TOP COVER

Melvin E. Clutter, Centralia, and Edward L. West, Sturgeon, both of Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Mar. 6, 1975, Ser. No. 555,876
Int. Cl.² H02G *1/02*; H01B *17/00*
U.S. Cl. 174—5 R **11 Claims**

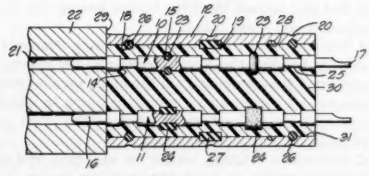


1. A pole top cover, comprising:
a pair of opposed, open bottom cover portions formed of electrical insulating material presenting an openable pole top cover,
said portions being configured to cooperatively define a space therebetween for receiving the upper end of a utility pole and having top segments configured for covering the top of said pole,
said portions also being configured to cooperatively define an opening in the upper end thereof adjacent said top segments for receiving an insulator-supporting pin attached to said upper end; and
means on said cover for releasably drawing said portions together to position said cover on said upper end and hold the same at any one of a number of vertical dispositions on the pole.

3,922,477
THROUGH-WALL CONDUCTOR SEAL

Anthony A. Glowacz, Northridge, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Filed Aug. 30, 1971, Ser. No. 176,171
Int. Cl.² H01B *17/30*; H01R *13/00*
U.S. Cl. 174—18 **2 Claims**

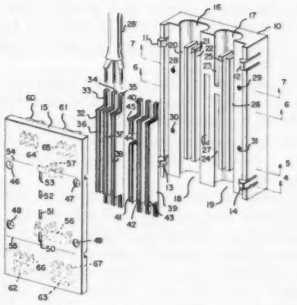


1. A sealed insulated electrical connector emplanted within a wall separating fluids of considerably different pressures to provide through-wall connection, comprising:
a hollow metal tube, the inner wall surface of which is formed into a plurality of continuous longitudinally spaced, circumferential grooves;
at least one metallic rod extending along the tube bore, said rod including a plurality of spaced, circumferential grooves;
first resilient annular members received within certain grooves of said metal tube leaving certain other of said grooves free;
second resilient annular members received within certain of said metallic rod grooves leaving certain other of said grooves free; and
a quantity of a rigid, adhesive, insulative material received within said metal tube filling the space between said inner tube wall surfaces and said rod and in continuous adhering contact therewith;
said metal tube with metallic rod and insulative material being secured within a wall opening with the tube ends being exposed to different fluid pressures.

3,922,478
UTILITY STRUCTURE USABLE AS ELECTRICAL WIRING EQUIPMENT

Preston R. Perkey, R.D. No. 1, Box 301, New Bloomfield, Pa. 17068

Filed Oct. 15, 1974, Ser. No. 514,434
Int. Cl.² H02G *3/18*
U.S. Cl. 174—53 **4 Claims**



1. An article of manufacture having a variety of uses in housewiring comprising:
a. a base housing having:
i. at least a first pair of couplers and a second pair of couplers for engaging conductive wiring;
ii. a first groove in said base running between said couplers of the first pair of couplers and a second groove in said base running between said couplers of the second pair of couplers, and
iii. conductors mounted in said grooves and exposed to the exterior of said base and running between the pairs of couplers, at least one of said conductors running between, but not completely connecting, said first pair of couplers to form an interrupted connection and at least one of said conductors running between and completely connecting said second pair of couplers to form a complete connection; and
b. a cover fitted over said base and attached thereto to thereby cover the exposed grooves and mounted conductors and characterized as having at least one adjustable conductive jumper tap bar connecting two or more conductors.

3,922,479

COAXIAL CIRCUIT CONSTRUCTION AND METHOD OF MAKING

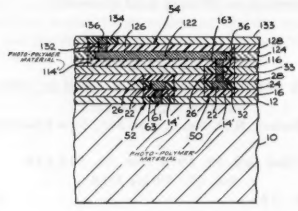
Robert B. Older, Woodland Hills, and Charles W. Smith, Canoga Park, both of Calif., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 180,886, Sept. 15, 1971, abandoned, which is a division of Ser. No. 858,923, Sept. 18, 1969, Pat. No. 3,649,274. This application Jan. 28, 1974, Ser. No. 437,450

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H05K *1/02*

U.S. Cl. 174—68.5 **5 Claims**



1. An electrical circuit construction providing at least one coaxial conductor comprising:

a stack of at least first, second, third, fourth and fifth adjacent contacting layers, said second, third and fourth layers being disposed between said first and fifth layers with adjacent surfaces in contact and with said third layer in the middle,

each of said first, second and third layers comprising separate portions of conductive and photo-polymer materials provided in a predetermined pattern with the outer surfaces of the conductive and photo-polymer material portions of each layer being of equal thickness and flush with one another,

said second and fourth layers having predetermined patterns such that each of said second and fourth layers comprises a conductive material portion surrounding a photo-polymer material path portion following a path corresponding to a predetermined path desired for said coaxial conductor and located so as to be oppositely disposed with respect to a like photo-polymer material path portion provided for the other of said second and fourth layers,

said third layer having a predetermined pattern such that said third layer comprises a conductive material portion surrounding a pair of spaced parallel photo-polymer material path portions likewise following said predetermined path and which in turn border and electrically isolate a conductive material path portion provided therebetween and constituting said coaxial conductor,

said spaced photo-polymer material path portions and said conductive material path therebetween provided in said third layer being disposed and dimensioned with respect to said photo-polymer path portions of said second and fourth layers so that said conductive material path portion of said third layer constituting said coaxial conductor is in contact with and completely encircled by photo-polymer material portions of said second, third and fourth layers, and

said first and fifth layers each providing conductive material overlapping said photo-polymer path portion on the respective one of said second and fourth layers to which it is adjacent and making contact with said surrounding conductive material path portion of said third layer constituting said coaxial conductor and encircling photo-polymer portions are in turn completely encircled by conductive material portions of said first, second, third, fourth and fifth layers,

said stack being additionally provided with sixth, seventh, eighth and ninth adjacent contacting layers constructed and arranged in a like manner as said second, third, fourth and fifth layers, respectively, and having predetermined patterns forming a second coaxial conductor in said seventh layer following a desired predetermined path.

3,922,480

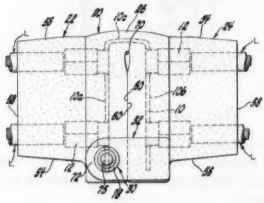
ELECTRICAL CONNECTION OF CONDUCTOR LEADS AND METHOD OF MAKING SAME

Robert C. Woofter, Cortland, and Warren Pearce, Jr., Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 9, 1974, Ser. No. 513,319

Int. Cl.² H01R *5/10, 43/00*

U.S. Cl. 174—72 R **4 Claims**



1. An electrical connection of electrical leads comprising: an elongated, planar bendable metal carrier strip;

a plurality of crimping flanges integrally connected via webs to one side of the carrier strip at spaced longitudinal locations therealong;

each of said crimping flanges being crimped to one end of an electrical lead whereby said electrical leads are electrically connected to each other via said carrier strip;

said webs being bent so that the plane of the carrier strip extends transversely of the axes of said one ends of said leads:

insulator means made from an elastic insulating material comprising a first insulator body molded around the end of at least one lead and adjacent carrier strip portion and a second insulator body molded around the one ends of the other remaining leads and adjacent carrier strip portion and a hinge means molded about an intermediate portion of the carrier strip and integral with the first and second insulator bodies,

said first and second insulator bodies being separated by said hinge means and lying side-by-side in substantially the same plane when molded,

said first and second insulator bodies having side surfaces adjacent said hinge means,

said first and second insulator bodies being relatively movable by bending the hinge means and the intermediate portion of the carrier strip at the hinge means from their side-by-side position to a second position in which said side surfaces are juxtaposed whereby the leads are oriented in the desired directions,

and cooperable latching means on said first and second insulator bodies to latch the insulator bodies in their second position when moved thereto.

4. A method of connecting electrical leads together and orienting the leads in desired directions comprising:

providing an elongated carrier strip integrally connected to a plurality of crimping flanges via webs at spaced longitudinal locations along one side edge thereof, simultaneously crimping each of said crimping flanges to one end of an electrical lead and bending the webs so that the carrier strip lies in a plane substantially normal to the axes of the one end of said leads, molding a resilient insulator

means around the one end of the leads and crimping flanges of the carrier strip to completely imbed the same within the insulator means and with the molded insulator means comprising a first insulator body surrounding the one end of at least one electrical lead and adjacent carrier strip portion, a second insulator body adjacent to but spaced from the first insulator body and surrounding the one ends of the remaining leads and adjacent carrier strip portion, a hinge means integral with the first and second insulator bodies and surrounding an intermediate carrier strip portion, an integral latch member on one of the insulator bodies and an integral catch member on the other of the insulator bodies, relatively moving the first and second insulator bodies by bending the intermediate carrier strip portion and hinge means until adjacent end surfaces on the first and second insulator bodies are located back-to-back, twisting the intermediate carrier portion and hinge means by relatively moving the insulator bodies toward and from their common plane when moved back-to-back to position and to align the catch and latch members and then twisting the insulator bodies about the intermediate portion of the carrier strip and hinge means in the opposite direction to cause the latch member to be latched to the catch member whereby the insulator bodies are latched in their back-to-back position and the leads are oriented in their desired direction.

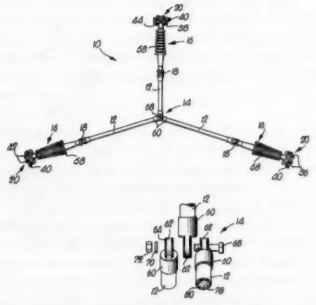
3,922,481
OPEN CONFIGURATION MIDSPAN ELECTRICAL CONDUCTOR SPACER

Paul E. Lewis, Mexico, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Division of Ser. No. 340,323, March 12, 1973, Pat. No. 3,867,566. This application Oct. 18, 1974, Ser. No. 515,864

Int. Cl.² H02G 7/12

U.S. Cl. 174—146 **6 Claims**



1. An adjustable midspan spacer for maintaining proximal high voltage conductors in spaced relationship, comprising:

a plurality of elongated, insulative spacer bars corresponding in number to said conductors and having means on the outer ends thereof adapted to gripingly engage one of said conductors;

means interconnecting said spacer bars at the ends thereof remote from said conductor-gripping ends to present an open, generally planar spacing assembly of dimensions permitting the same to be positioned within the space between said conductors,

said interconnecting means including structure for locking said spacer bars at desired orientations in the plane of said assembly and being releasable to permit selective pivotal movement of the spacer bars about the point of interconnection of the same and in the plane of said spacing assembly.

3,922,482
WIRED BROADCASTING SYSTEMS

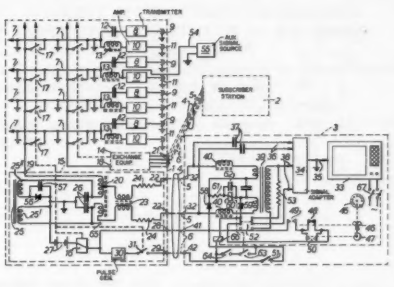
Ralph Parton Gabriel, Chobham, Near Woking, and Eric John Gargini, West Drayton, both of England, assignors to Communications Patents Limited, London, England

Filed Aug. 20, 1971, Ser. No. 173,390

Claims priority, application United Kingdom, Aug. 20, 1970, 41537/70

Int. Cl.² H04N 1/44

U.S. Cl. 178—5.1 **7 Claims**



1. In a wired broadcasting system constructed for processing one of a plurality of programme signal channels over a cable between a programme exchange and one of a plurality of subscriber's stations, means responsive to a signal from a subscriber's station selecting one of the plurality of different programme signal channels available at said programme exchange for transmission over said cable to that subscriber's station, auxiliary signal generating means arranged to provide on at least one of said programme signal channels an auxiliary signal for transmission over the cable connection between the programme exchange and the subscriber's station upon selection of that said programme signal channel, and signal responsive means associated with the subscriber's equipment actuated from receipt of said programme signals on said at least one channel for modifying the operation of the subscriber's receiving equipment in response thereto by switching the subscriber's selection away from said selected channel at said programme exchange to another channel if a predetermined condition is established preventing access to that signal channel.

3,922,483
TUNABLE TELEVISION RECEIVER CIRCUITS WITH AUTOMATIC PHASE CONTROL

Luigi Indri, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Nov. 14, 1973, Ser. No. 415,495

Claims priority, application United Kingdom, Apr. 10, 1973, 17174/73

Int. Cl.² H04N 5/50

U.S. Cl. 178—5.8 AF **2 Claims**

1. In a television receiver having a mixer stage coupled to a tunable local oscillator stage and to a source of television signals to provide picture and sound intermediate frequency signals, a tunable automatic phase control circuit comprising:

synchronous demodulator detector means coupled to the output of said mixer stage for receiving said picture and sound intermediate frequency signals;

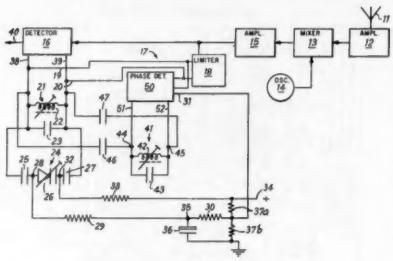
amplitude limiting amplifier means coupled to said mixer stage and providing a first picture intermediate frequency signal of unmodulated amplitude;

resonant circuit means coupled to said synchronous demodulator detector means and to said amplitude limiting amplifier means, said resonant circuit means including a variable reactance means in the form of a varactor diode;

reference frequency resonant circuit means coupled to

said resonant circuit means and providing a second picture intermediate frequency signal of unmodulated amplitude;

phase difference detecting synchronous demodulator means coupled to said amplitude limiting amplifier means and said resonant circuit means and to said reference frequency resonant circuit means, said phase difference detecting synchronous demodulator means receiving said first and second picture intermediate frequency signals of unmodulated amplitude and providing a control signal



which varies in accordance with the phase difference between said first and second picture intermediate frequency signals; and

circuit means coupling said control signal from said phase difference detecting synchronous demodulator means to said variable reactance means of said resonant circuit means whereby said resonant circuit means provides a resonance oscillation for effecting demodulation of said first picture intermediate frequency signal by said synchronous demodulator detector means.

3,922,484

METHOD FOR THE RASTERED REPRODUCTION OF COLORED CONTINUOUS TONE IMAGES OF SINGLE OR MULTICOLOR ORIGINALS

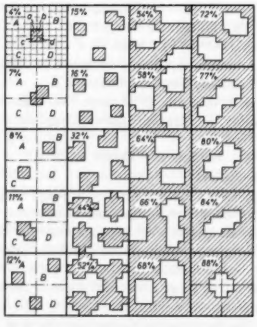
Hans Keller, Kiel, Germany, assignor to Dr. Ing. Rudolf Hell, GmbH, Germany

Filed Dec. 19, 1973, Ser. No. 426,091

Claims priority, application Germany, Dec. 22, 1972, 2262824

Int. Cl.² H04N 7/00

U.S. Cl. 178—6 **3 Claims**



1. A method for the rastered reproduction of colored continuous tone images in single or multi-color printing, in which the image original for the individual printing colors are separately scanned optical-electrically to form respective electrical signals which are quantized in accordance with tone value steps, with the quantized signals controlling one or more recording units by means of which a printing form for the individual printing colors is produced, and in which the surface of the printing form is divided into a network of orthogonal raster sections, the individual raster sections being divided into several orthogonal partial areas, with the signals obtained during the scanning being quantized with such a pulse that each partial area is provided with a quantization pulse, the recording units being so controlled by means of the signals derived during the quantization that within the partial areas of the raster sections one or more coverage spots are recorded on the printing form as printing dots, the surface coverage of which has a size corresponding to the associated tone value, characterized by recording up to a tone value which corresponds to the size of the smallest printable dot the coverages formed on the partial areas within the sections as a single coherent covering spot, enlarging such covering spot with increasing tone values, dividing the spot into two covering spots when approximately twice the size of the smallest printable dot is reached, similarly enlarging and dividing the covering spots with increasing tone values, and enlarging the covering spots up to a predetermined tone value, and with a further increase in tone value, decreasing the size of the uncovered areas until they are reduced to the smallest printable size, and with further increasing tone value decreasing the number of the uncovered surface areas.

3,922,485

FLYING SPOT SCANNER WITH SCAN DETECTION

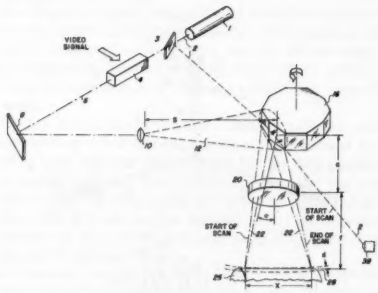
Gary K. Starkweather, Saratoga, and Robert P. Kowalski, Campbell, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 27, 1972, Ser. No. 309,860

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H04N 1/22

U.S. Cl. 178—7.6 **18 Claims**



1. Apparatus for recording information from an electrical signal onto a scanned medium comprising:

means for providing a beam of high intensity light,

means for modulating the light beam in accordance with the transmission of information represented by an electrical signal,

first optical means for expanding said modulated beam,

second optical means in convolution with said first optical means for imaging said expanded, modulated beam to a spot in a focal plane coextensive with the surface of a light sensitive medium at a predetermined distance from said second optical means,

scanning means positioned between said first and second means for scanning the spot across said medium, said scanning means having a reflective element, a portion of which is illuminated by said modulated beam to direct said spot to said medium,

means positioned between said light beam providing means and said modulating means for splitting the unmodulated

beam such that an unmodulated beam is directed at the illuminated portion of said scanning means,

said scanning means further scanning a spot of unmodulated light throughout a scan width unassociated with said medium, and

means for detecting and indicating the start of the scan of said spot of unmodulated light.

3,922,486

SIGNALLING SYSTEM

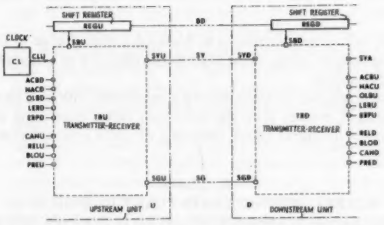
Jacques Henri DeJean, Ris Orangis, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,538

Claims priority, application France, June 26, 1973, 73.23273

Int. Cl. G08c *15/12*

U.S. Cl. 178—68 **1 Claim**



1. A signalling system for a data transmission system transmitting digital data messages character by character comprising:

a first unit including

a message output register capable of storing a character of said message and having an advance input,

a clock to generate a clock signal; and

a first signalling transmitter-receiver coupled to said clock and said advance input of said output register, said first transmitter-receiver controlling the coupling of said clock to said advance input of said output register;

a second unit including

a message input register capable of storing a character of said message and having an advance input, and

a second signalling transmitter-receiver coupled to said advance input of said input register;

a first wire coupled between said output register and said input register to transmit said message characters serially from said output register to said input register;

a second wire coupled to said clock and between said first and second transmitters-receivers to transmit said clock signal therebetween for synchronization of said first and second transmitters-receivers and said output and input registers; and

a third wire coupled between said first and second transmitters-receivers for signalling by on-off type signals, each of said signalling signals having a suitable change of state on said third wire at predetermined bit times of said message character being transmitted on said first wire;

said states on said third wire being defined by the presence or absence of a current on said third wire; and

each of said first and second transmitters-receivers including

switching means coupled to the associated end of said third wire to apply to said third wire during each of said predetermined bit times a suitable potential for signalling during a transmitting mode of operation,

control means coupled to said switching means to control said switching means as a function of predetermined signals to be transmitted or received at each of said predetermined bit times,

detection means coupled to said third wire for detecting which of said predetermined signals is present on said third wire, and

means coupled to said detection means, said means being controlled by said detection means for transmitting said clock signal to said advance input of an associated one of said output and input registers.

3,922,487

CIRCUIT ARRANGEMENT FOR ADJUSTING THE LINE CURRENT IN TELEGRAPHY SUBSCRIBER CONNECTION CIRCUITS OF AN EXCHANGE INSTALLATION

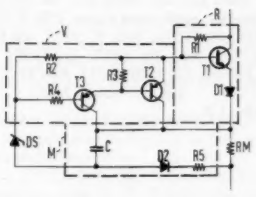
Fritz Giebler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 15, 1971, Ser. No. 162,914

Claims priority, application Germany, July 16, 1970, 2035379

Int. Cl.² H04L *25/02*

U.S. Cl. 178—69 R **3 Claims**



1. Apparatus for adjusting the magnitude of line current in telegraph subscriber connection circuits, each said connection circuit including a supplementary resistance for maintaining a constant current flow, comprising:

means for sensing the magnitude of the line current,

means for comparing said sensed magnitude with a reference magnitude, and for producing an output corresponding to the difference between said magnitudes,

adjustable resistance means in the line current path forming said supplementary resistance,

means for adjusting said adjustable resistance in dependence on the value of said comparison means output and means for introducing delay into the adjustment of said adjustable resistance means, the magnitude of said delay being such that the value of said adjustable resistance means remains substantially constant during pulse edges and intervals between pulses.

3,922,488

FEEDBACK-CANCELLING ELECTRO-ACOUSTIC TRANSDUCER APPARATUS

Saad Zaghloul Mohamed Gabr, Canterbury, England, assignor to A.R.D. Anstalt, Vaduz, Liechtenstein

Filed Dec. 17, 1973, Ser. No. 425,527

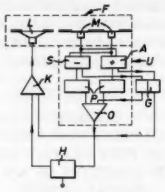
Claims priority, application United Kingdom, Dec. 15, 1972, 58174/72; Jan. 9, 1973, 1071/73

Int. Cl.² H04M *1/60*

U.S. Cl. 179—1 HF **3 Claims**

1. An electro-acoustic transducer apparatus comprising a loudspeaker and microphone means having two closely spaced transducers, electronic circuit means, said circuit means including an additive circuit element and a substractive circuit element, each of said elements receiving output from both of said transducers, said elements providing two outputs one of which is wanted sound plus noise and the other of which is only noise, said circuit means comprising also phase adjustment means to receive said other output and to produce

a noise component 180° out of phase with said other output, said circuit means comprising also means to combine said one



output with said out-of-phase component to cancel noise from said one output.

3,922,489

ECHO MICROPHONE OF THE HANDY TYPE

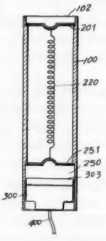
Shin Ojima; Tooru Yoshimura; Kazuhiko Oogami, and Aitaka Umezaki, all of Yao, Japan, assignors to Hoshidenkiseizo Kabushikikaisha, Yao, Japan

Filed Jan. 29, 1974, Ser. No. 437,740

Claims priority, application Japan, Feb. 5, 1973, 48-16073; Feb. 5, 1973, 48-16074; Feb. 5, 1973, 48-16075; May 26, 1973, 48-61797; May 26, 1973, 48-61798; May 26, 1973, 48-61799; July 31, 1973, 48-90875; July 31, 1973, 48-90876

Int. Cl.² H04R *7/00*

U.S. Cl. 179—1 J **2 Claims**



1. An echo microphone of the handy type comprising a housing suitable for grasping with a front opening end for receiving sound and a rear end, a first diaphragm fixed to close the front opening end of the housing, a second diaphragm spaced from the first diaphragm at a predetermined distance and fixed to the inner wall of said housing, a reverberation spring coupled between said first and second diaphragm, and a microphone unit disposed at the rear end of said housing and having a third diaphragm spaced from the second diaphragm at a predetermined distance, the diameter of the third diaphragm being substantially the same as the inner diameter of the housing so as to form a closed chamber between said second and third diaphragms.

3,922,490

ALARM AND UTILITY METER READING SYSTEM EMPLOYING TELEPHONE LINES

Charles D. Pettis, 2304 Stanley Ave., Las Vegas, Nev. 89101

Filed June 18, 1973, Ser. No. 370,975

Int. Cl.² H04M *11/00*

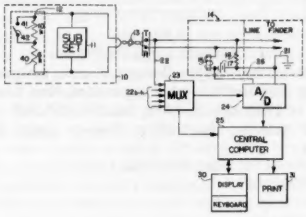
U.S. Cl. 179—2 A **20 Claims**

1. A signalling system for use in conjunction with a telephone subscriber set, a pair of line conductors forming a subscriber loop and a central location for concentrating a number of subscriber lines comprising

a resistance element including a plurality of series connected discrete resistances;

said resistance element connected across said line conductors without any active or reactive elements in D.C. conduction relationship with said subscriber loop and in parallel with said telephone subscriber set;

at least one normally open switch connected across one of said discrete resistances;



said switch being closable to produce a step change in D.C. resistance of the subscriber loop indicative of a signalling condition;

said resistance element having a resistance with said switch closed greater than the minimum value interfering with normal central office switching or voice conversation.

3,922,491

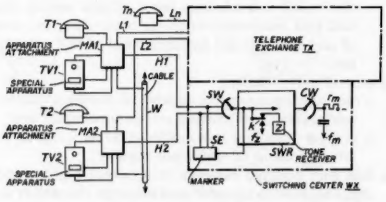
TELECOMMUNICATION PLANT IN WHICH A WIDE-BAND CHANNEL IF WANTED IS CONNECTED BY THE SIDE OF A TELEPHONE CONNECTION

Harold John Carl Bjork, Trangsund, and Torben Erik Caroc, Bandhagen, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 250,978, May 8, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,459

Int. Cl.² H04M *11/00*

U.S. Cl. 179—2 TV **6 Claims**



1. An automatic telephone plant for connecting a calling subscriber to a called subscriber comprising:

a first line system for voice telephone traffic having a first subscriber line, a second subscriber line and a telephone exchange actively connecting said first subscriber line to said second subscriber line;

a second line system for wideband telesignal traffic having a first control signal line, a second control signal line, a cable having at least one wideband communications channel, and a switching center connected to said first and second control signal lines;

a first subscriber station comprising:

a first subscriber telephone,

a first wideband communications apparatus, and

a first apparatus attachment, said first apparatus attachment comprising first connecting means for connecting said first subscriber line to said first subscriber telephone, a first control means having a control signal input responsive to a wideband connection control signal for connecting said wideband communications channel to said first wideband communications apparatus, and a first switch means including means when

operated for connecting said first subscriber line to the control signal input of said first control means and to said first control signal line;

a second subscriber station comprising:

a second subscriber telephone,

a second wideband communications apparatus, and

a second apparatus attachment, said second apparatus attachment comprising second connecting means for connecting said second subscriber line to said second subscriber telephone, a second control means having a control signal input responsive to said wideband connection control signal for connecting said wideband communications channel to said second wideband communications apparatus and a second switch means including means when operated for connecting said second subscriber line to the control signal input of said second control means and to said second control signal line;

said switching center including means responsive through said first control signal line to the operation of said first switch means for generating a tone signal for transmission via said first control signal line, said first switch means, said first subscriber line, said telephone exchange, said second subscriber line and said second connecting means to said second subscriber telephone, and including means responsive through said second control signal line to the operation of said second switch means after the operation of said first switch means for generating said wideband connection control signal for transmission via said second control signal line to said second switch means and the control signal input of said second control means, and also from said second switch means via said second subscriber line, said telephone exchange, said first subscriber line, said first switch means to the control signal input of said first control means whereby said first and second wideband communications apparatuses are connected to the one wideband communications channel of said cable.

3,922,492

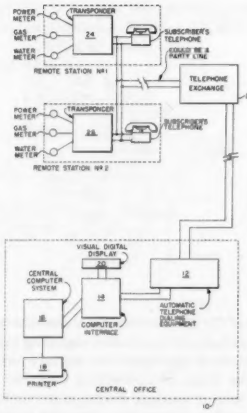
REMOTE METER READING TRANSPONDER

James Ray Lumsden, 107 Grandin Village, St. Albert, Alberta, Canada

Filed Mar. 18, 1974, Ser. No. 452,287

Int. Cl.² H04M *11/00*

U.S. Cl. 179—2 A **28 Claims**



1. A system for remotely reading utility meters comprising:

a. a centrally located unit comprising:

i. a digital computer having a first storage unit for storing a plurality of binary interrogation code trains, and a second storage unit for receiving binary code trains and a control unit;

ii. an automatic telephone dialing unit, controllable by said control unit;

iii. a first computer/telephone interface, said interface connecting said computer to said automatic dialing unit, said interface also processing codes compatible with said computer into codes compatible with said automatic dialing unit, said interface also processing codes compatible with said automatic dialing unit into codes compatible with said computer;

b. a plurality of remotely located transponders, each transponder being comprised of:

i. a second computer/telephone interface, said second interface connecting said transponder to said computer via a telephone line, a central exchange, said automatic dialing unit and said first interface, said second interface adapting codes from said telephone lines for use in said transponder and adapting codes from said transponder for transmission over said telephone line;

ii. a decoder, said decoder being connected to said second interface and producing an output pulse in response to a particular one of said plurality of binary interrogation code trains received from said centrally located unit,

iii. a storage unit connected to at least one sending unit, said sending unit being connected to a utility meter, said storage unit storing in binary coded decimal form the curent reading of each utility meter thereto connected;

iv. a transmitter, said transmitter being connected to said storage unit and also connected to said second computer/telephone interface;

v. a control circuit connected to said decoder, said control circuit switching from a first state to a second state upon receipt of said output pulse, said control circuit switching from said second state to a third state upon receipt, a second time, of said output pulse within a predetermined time period, said control circuit switching from said second state to said first state if said output pulse is not received within said predetermined time period, said control circuit, when in said third state, controlling said transmitter to transmit said binary code trains from said storage units to said second storage units of said computer, said control circuit switching from said third state to said first state upon the termination of said transmission.

3,922,493

COMMUNICATION SYSTEM USING TIME-DIVISION MULTIPLEXING AND PULSE-CODE MODULATION

Theodore Brenig, and Robert T. Gordon, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Feb. 1, 1971, Ser. No. 111,436

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 AP **20 Claims**

1. An improved time-division multiplex, pulse-code modulation transmitter for a plurality of channels, each having information and signalling, said transmitter comprising:

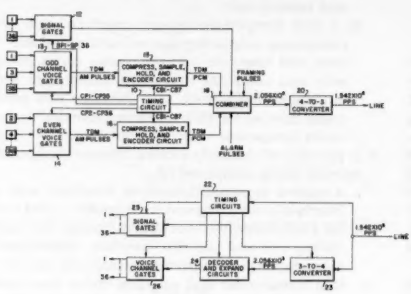
a. means for repetitively sampling the information in each of said channels in a selected order, one sample from each of said channels comprising a frame;

b. means coupled to said sampling means for encoding each of said samples as binary pulses in said selected order, the sequence of binary pulses encoding one sample from each of said channels also comprising a frame;

c. means for repetitively indicating the presence or absence of signalling in each of said channels in a selected order;

d. means coupled to said encoding means and to said signal indicating means for combining a selected number of said signalling indications at one end of each of a selected number of frames of binary pulse sequences;

e. and means coupled to said combining means for converting each group of four binary pulses to a group of three



ternary pulses in accordance with a selected code for transmission over a communications circuit.

3,922,494

DATA SIGNAL SWITCHING APPARATUS

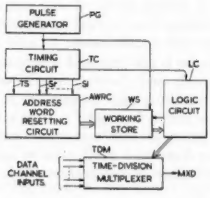
Gordon Arthur Cooper, Horndean; Kenneth Douglas Goddard, Alton, and Gordon Campbell Lowe, Farnborough, all of England, assignors to British Minister of Defence, London, England

Filed Mar. 25, 1974, Ser. No. 454,502

Claims priority, application United Kingdom, Mar. 26, 1973, 14465/73

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 BV **5 Claims**



1. A data-signal switching apparatus for controlling the switching and time-division multiplexing of signals appearing on a multitude of data input channels so that the signals on various data input channels will be sampled at various selected sampling rates and transmitted in a time-division multiplex cycle with a prescribed time-slot rate, the said apparatus including:

a pulse generator means for providing pulses at a rate *p* times the time-slot rate, where *p* is a positive integer;

a timing circuit means controlled by the pulse generator means for forming at each of a plurality of outputs a separate one of a plurality of periodic pulse sequences, said plurality of periodic pulse sequences comprising a sequence of pulses at the time-slot rate and a separate restarting pulse sequence for each of the required sampling rates having a pulse repetition rate equal to the associated sampling rate;

a working store capable of storing one address word for each of the sampling rates required;

address resetting means controlled by the timing circuit means, capable of storing a set of starting address words comprising one starting address word for each sampling rate and constructed to act in response to each pulse of each restarting pulse sequence by replacing one of the address words in the working store with a starting address word associated with the sampling rate of the restarting pulse sequence to which the pulse belongs;

a time-division-multiplex circuit which includes a plurality of gate circuits separately connected to different data input channels, address input means, and a decoder circuit connected to control the gate circuits so as to respond to the application of an address word to the address input means by enabling an associated one of the gate circuits to pass signals from the data input channel to which it is connected;

and a logic circuit means controlled by the timing circuit means for selecting one of the address words held in the working store in each time-slot, applying the selected word to the address input means of the time-division-multiplex gating circuit, and adding a predetermined increment to the selected word in the working store to form a new address word.

3,922,495

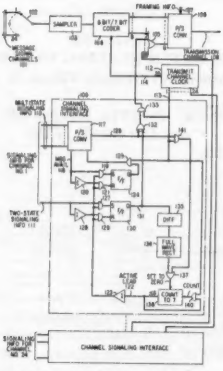
DIGITAL SIGNALING ON A PULSE CODE MODULATION TRANSMISSION SYSTEM

Douglas Carroll Donohoe, New Monmouth, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1974, Ser. No. 463,532

Int. Cl.[2] H04J *1/14*

U.S. Cl. 179—15 BY **9 Claims**

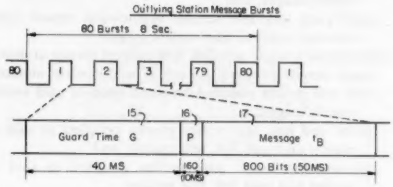


1. A method for simultaneously transmitting two-state signaling information and multistate signaling information over a single reoccurring digit space in a digital transmission system comprising the steps of converting said two-state signaling information into a unidigit binary representation and said multistate signaling information into the multidigit word bit stream, developing on a digit-by-digit basis the modulo-2 sum of said unidigit binary representation and said multidigit word bit stream, and inserting each digit of said modulo-2 sum into said single reoccurring digit space.

3,922,496
TDMA SATELLITE COMMUNICATIONS SYSTEM WITH GUARD BAND OBVIATING ONGOING PROPAGATION DELAY CALCULATION

Ova Gene Gabbard, Germantown, Md.; John M. Husted, Vienna, Va.; Pradman P. Kaul, Gaithersburg; Andrew M. Werth, Silver Spring, both of Md., and Andrew M. Walker, Reston, Va., assignors to Digital Communications Corporation, Gaithersburg, Md.

Filed Feb. 11, 1974, Ser. No. 441,710
Int. Cl.² H04J *3/06*
U.S. Cl. 179—15 BS **15 Claims**



1. In a time multiplex communication system wherein a plurality of stations with a propagation delay variation ϵ transmit in a TDMA mode to a satellite, a method ensuring non-overlapping reception at said satellite without measuring actual propagation delay comprising the steps of:

a. transmitting to each of said stations a reference

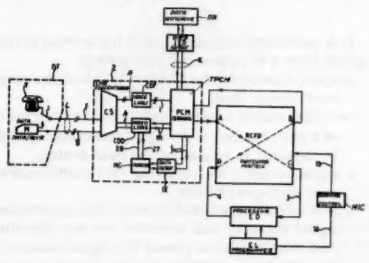
b. transmitting from each station that has information to transmit in a time slot beginning a predetermined time subsequent to receipt of said marker, said predetermined time different for each of said stations,

c. controlling said transmissions to last for a predetermined time less than the duration of said time slot so that a guard time G is provided which is at least equal to twice said propagation delay variation ϵ.

3,922,497
SWITCHING SYSTEM FOR PCM COMMUNICATION WITH ALTERNATE VOICE AND DATA TRANSMISSION

Auro Artom, and Carlo DeMichelis, both of Torino, Italy, assignors to CSELT Centro Studi e Laboratori Telecomunicazioni, Torino, Italy

Filed Mar. 21, 1974, Ser. No. 453,546
Claims priority, application Italy, Mar. 21, 1973, 67802/73
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 AQ **8 Claims**



1. In a pulse-code-modulation system, in combination:

a central office;

a plurality of outlying stations connected to said central office via respective signal paths, said stations being provided with data-communication equipment connected to said signal paths;

programming means at said central office for establishing a recurrent frame composed of a multiplicity of message channels each constituted by a respective time slot in said frame;

incoming and outgoing register means at said central office each having a number of stages corresponding to that of said channels, each of said stages being permanently associated with a respective channel;

input means at said central office for respectively directing data signals from a first and a second station to a first and a second stage of said incoming register means associated with a first and a second channel allocated to said first and said second station, respectively;

output means at said central office for direction data from a first and a second stage of said outgoing register means, respectively associated with said first and second channels, to said first and second stations, respectively;

transfer means at said central office controlled by said programming means for periodically delivering the contents of said first and second stages of said incoming register means to said second and first stages, respectively, of said outgoing register means to enable two-way data transmission between said first and second stations; and

ancillary register means at said central office having stages paired with those of said incoming and outgoing register means for the storage of service information pertaining to a connection between said first and second stations;

said first and second stations being provided with voice-communication equipment and with switchover means for temporarily connecting said voice-communication equipment to the signal paths thereof in lieu of said data-communication equipment, said central office including line links temporarily allocable by said programming means to said stations, said line links being respectively assigned to said channels and coupled to said programming means for engaging the register stages associated with the assigned channel upon temporary allocation of a line link by said programming means to a station, each line link being provided with monitoring means for discriminating between a voice-communication state and a data-communication state on a signal path temporarily connected thereto and for commanding said programming means to keep said service information stored in said ancillary register means upon a switchover from said data-communication state to said voice-communication state for possible resumption of data transmission between said first and second stations.

3,922,498
AUTOMATIC CALLING LINE IDENTIFICATION ARRANGEMENT

Guy Darrell Aul, Niles; James Russell Ballard, and Roger Alan Fraser, both of Wheaton, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 1, 1974, Ser. No. 465,770
Int. Cl.² H04Q *5/02*
U.S. Cl. 179—17 A **10 Claims**

1. In a telephone system having an AMA office and a local office, said local office comprising:

a plurality of two-party lines,

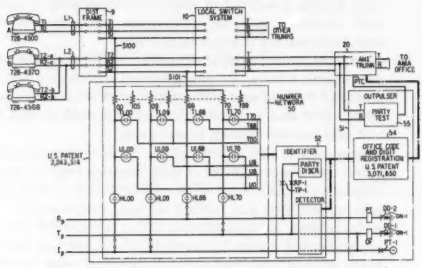
means operative upon a service request from either party on a two-party line for identifying the directory number of a first party on said two-party line,

an outpulser,

means in said outpulser responsive to said first party directory number identification for determining whether said first party or the second party on said two-party line is requesting service,

means in said outpulser operative upon said determination by said determining means for outpulsing said first party directory number to said AMA office when said first party is requesting service,

means operative upon said determination by said determining means for identifying the directory number of said second party when said second party is requesting service, and



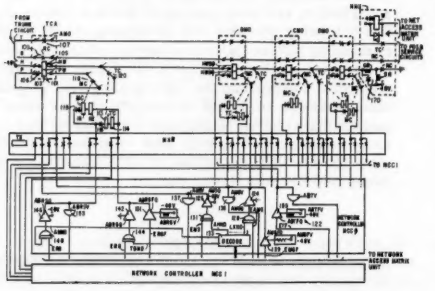
means in said outpulser responsive to said second party directory number identification for outpulsing said second party directory number to said AMA office.

3,922,499

COMMUNICATION SWITCHING SYSTEM NETWORK CONTROL ARRANGEMENT

Gregory R. Athas, Hanover Park; Johannes Draayer, Wheaton; William F. Malfese, Medinah; Nigel J. E. Reynolds, Elk Grove Village, and George W. Potenza, Western Springs, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 14, 1973, Ser. No. 397,453
Int. Cl.² H04Q *3/42*
U.S. Cl. 179—18 GE **1 Claim**



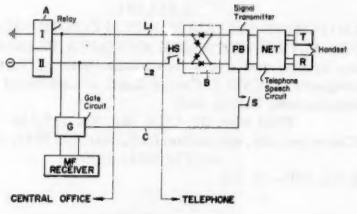
1. In a communication switching system having a group of switching network units, each unit comprising at least two crosspoint matrix stages coupled by links, each network unit having a plurality of inlets and a plurality of outlets and having a plurality of switching devices for closing paths coupling inlets and outlets, each one of the devices having control means energizable for causing the paths to be closed, common control equipment for causing selectively the activation of said control means to establish paths through said network units, a network control arrangement comprising:
- means coupling together corresponding ones of said control means of said matrix stages so that said corresponding ones of said control means can be energized simultaneously;
- distributing means for selecting one of said control means to permit it to be activated; and
- switching means for coupling selectively each one of the control means of a selected network unit to said distributing means so that said distributing means can permit the selected control means to be activated;
- testing means for checking selected switching devices;
- sequence check control means coupled to said network units;
- variable sequence translation means coupled to said network unit means;
- whereby said testing means may be operated in any sequence and any device may be operated and checked in any desired order, at any time,
- said testing means comprising;
- hold path release verification means comprising,
  - hold path link test sensors coupled between each of said matrix stages;
  - test voltage insertion means coupled between each of said matrix stages; and
  - hold path link test sensor verification means coupled between each of said matrix stages;
- simultaneous mark and link test control means comprising,
  - mark means coupled to each of said control means;
  - link test means coupled between each of said switching matrix stages;
  - mark and link test sensor means coupled to said mark means and said link test means; and
  - sensor verification gate means coupled to said mark means and said link test means;
- circuit pull verification means coupled to each of said matrix stages comprising,
  - pull test sensor means coupled to said circuit pull verification means; and
  - sensor verification gate means coupled to said circuit pull verification means.

3,922,500

PUSHBUTTON DIALING SYSTEM

Toshiichi Takano, Mitaka, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,746
Claims priority, application Japan, June 4, 1973, 48-62806
Int. Cl.² H04M *1/50*
U.S. Cl. 179—84 VF **14 Claims**

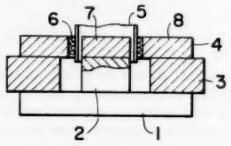


1. A push-button dialing system for sending multifrequency signals from a telephone set comprising:
- a signal transmitter for sending said multifrequency signals over speech lines,
- switching means actuated only in response to the depression of a push-button on the signal transmitter and deactuated in response to release of the push-button,
- a signal receiver for receiving said multifrequency signals over said speech lines,
- a gate circuit connected between the speech lines and the signal receiver and actuated by the actuation of said switching means to permit the signal receiver to receive the signals transmitted over the speech lines, and
- a control line connected between the switching means and a control electrode of the gate circuit for sending a signal to the gate circuit in response to the actuation of said switching means so that said signal receiver can receive said multifrequency signals sent from said signal transmitter over the speech lines only when a subscriber depresses push-buttons on a telephone set.

3,922,501
MOVING VOICE COIL ELECTRO-ACOUSTIC CONVERTER WITH LAMINATED MAGNETICALLY ANISOTROPIC POLES

Isao Yamamuro, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 18, 1972, Ser. No. 315,962
Claims priority, application Japan, Dec. 17, 1971, 46-102517The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.
Int. Cl.² H04R 9/02
U.S. Cl. 179—115.5 R 1 Claim

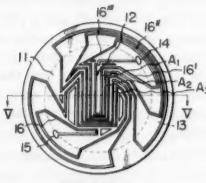


1. In an electro-acoustic converter comprising:
a. a center pole;
b. voice coil means surrounding said center pole;
c. magnetic means surrounding said center pole and said voice coil means; and
d. plate means fixed to said magnetic means, said plate means and said center pole defining an air gap accepting said voice coil; the improvement comprising
e. wherein all of said plate means and that portion of said center pole defining said air gap consist of magnetically anisotropic sheets laminating magnetically anisotropic sheets.

3,922,502
DIAPHRAGM FOR ELECTROACOUSTIC TRANSDUCER

Shunichi Tabuchi, Okutama, Japan, assignor to Foster Electric Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1975, Ser. No. 537,939
Int. Cl.² H04R 9/02
U.S. Cl. 179—115.5 PV 6 Claims



1. A diaphragm for electroacoustic transducers comprising a circular diaphragm membrane of a nonmagnetic and highly insulative material, and a series of conductors formed on said membrane and including radial outlet parts arranged substantially at regular intervals as extended from central section to peripheral section of the circular membrane, arcuate outlet parts respectively connecting said radial outlet parts with one another at their ends on the peripheral side, and central parallel conductor parts disposed substantially in the central section of the circular membrane and connected in series with the other central side ends of the radial outlet parts.

3,922,503
DIAPHRAGM FOR ELECTROACOUSTIC TRANSDUCER

Shunichi Tabuchi, Okutama, Japan, assignor to Foster Electric Co., Ltd., Tokyo, Japan

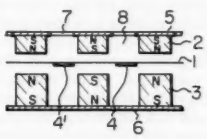
Filed Jan. 2, 1975, Ser. No. 537,940
Int. Cl.² H04R 9/02
U.S. Cl. 179—115.5 PV 6 Claims

1. A diaphragm for electroacoustic transducer comprising a circular membrane of a nonmagnetic and insulative material, and a series of conductors formed at least on a surface of said membrane, said conductors including parallel conductors and a group of outlet parts interconnecting said parallel conductors with one another and with external terminals of the transducer and a group of localized area reinforcements likewise formed on said membrane and only situated at locations of said membrane which do not contain said series of conductors and electrically insulated from said series of conductors and adapted to increase the rigidity of the diaphragm.

3,922,504
ELECTROACOUSTIC TRANSDUCER

Kenichiro Kishikawa, Musashino, and Yougi Honda, Fussa, both of Japan, assignors to Foster Electric Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1975, Ser. No. 538,176
Int. Cl.² H04R 9/02
U.S. Cl. 179—115.5 PV 5 Claims

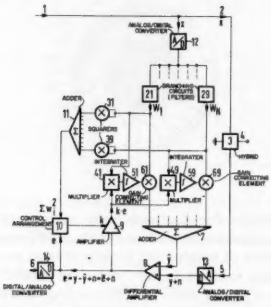


1. An electroacoustic transducer comprising
a pair of magnetic circuits respectively including at least a pair of permanent magnets and a soft iron plate bridged between opposite polarity ends of said magnets and opposing one another through a clearance so that magnetic flux flowing between the other ends of the magnets will be superposed on another as oriented in the same direction and along said clearance, said soft iron plate in one of said magnetic circuits having perforations for allowing sounds to pass therethrough, and
a diaphragm made of a non-magnetic and insulative material and extended within said clearance between the pair of magnetic circuits, said diaphragm having at least on one surface a series of conductors substantially extending in a direction transverse said magnetic flux direction,
said permanent magnets in said magnetic circuit of the side having said perforations being smaller than those in the other magnetic circuit in the dimension in opposing direction of the magnetic circuits.

3,922,505
ECHO CANCELLER

Harald Höge, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 9, 1973, Ser. No. 387,123
Claims priority, application Germany, July 6, 1973, 2334546; Aug. 10, 1972, 2239440; Aug. 10, 1972, 2239452
Int. Cl.² H04B 3/20
U.S. Cl. 179—170.2 2 Claims



1. An echo canceller for a long-distance telephone circuit comprising a four-wire circuit including an incoming path and an outgoing path and a hybrid, said echo canceller comprising a branch network connected to the incoming path of the four-wire circuit and having a plurality of outputs, said branch network corresponding to systems having linear independent pulse responses operable to provide a plurality of output signals,

an adder,

a plurality of adjustable gain elements connected between said outputs and said adder, said adder providing a simulated echo signal,

subtracting means in the outgoing path connected to said hybrid and to the output of said adder for subtracting the simulated echo signal from the echo signal in the outgoing path to provide a remaining echo signal,

squaring means for squaring said output signals,

summing means connected to said squaring means for summing the squared signals,

a control arrangement connected to the output of said subtracting means and to the output of said summing means for providing a weighting factor from the remaining echo signal and the sum of the squared signals,

a controllable element connected to said subtracting means and to said control arrangement for multiplying the remaining echo signal by the weighting factor,

multipliers including inputs connected to said branch network outputs and to said controllable element and outputs connected to said adjustable gain elements for multiplying the respective output signals with the weighted remaining echo signal,

said control arrangement operable to decrease the weighting factor from a maximum value the greater the interference and the more accurately the adjustable gain elements have been set.

3,922,506
ACOUSTICAL TESTING SYSTEM

George Joseph Frye, 12175 SW. Douglas, Portland, Oreg. 97225

Filed Jan. 3, 1974, Ser. No. 430,462
Int. Cl.² H04R 29/00
U.S. Cl. 179—175.1 A 11 Claims

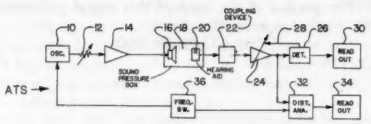
1. An acoustical testing system comprising:

oscillator means for generating a selected signal frequency;

amplifier means for receiving said signal frequency and amplifying same to provide an amplified driving signal;

means coupling said driving signal to an acoustical device to be tested;

means receiving an output from the device to be tested and automatically processing such output to operate readout



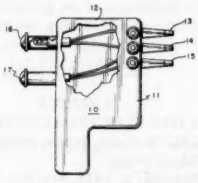
means to provide a readout of the sound pressure level of the device; and

distortion analyzer means receiving an output signal from said receiving and processing means and automatically processing said output signal to operate further readout means to produce a readout of the harmonic distortion of the signal from the device under test.

3,922,507
DISTRIBUTING TERMINAL ASSEMBLY TEST APPARATUS

Arthur N. White, 13920 Ash Way, Alderwood Manor, Wash. 98036

Filed Mar. 4, 1974, Ser. No. 447,715
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 R 4 Claims



1. A method of testing telephone trunks and the like comprising the steps of connecting distribution terminal assemblies and the like from said telephone trunk to terminals of a distribution terminal assembly tester comprising a housing,, and a circuit including three probes corresponding to tip, ring and sleeve of said trunk terminal, and a pair of light emitting indicators connected with the first probe connected to one contact of the first indicator, the second probe connected to one contact of the second indicator, and the third probe connected in common to the contacts of each of said indicators opposite said contacts connected to said first and second probes respectively.

3,922,508
CODED TELEPHONE LINE TESTING EQUIPMENT

Brian B. Brady, Minneapolis, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

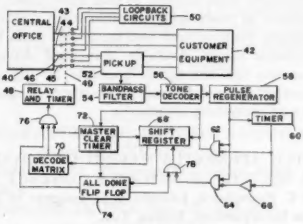
Filed Jan. 14, 1974, Ser. No. 432,806
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 R 7 Claims

1. Apparatus for the testing of a communication circuit from one point to another remote point comprising in combination:

means for applying a coded series of pulses to the circuit, said pulses comprising a plurality of clock controlled evenly spaced pulses with shift register controlled code pulses between some of the evenly spaced pulses;

sensing means in the circuit at the remote point for sensing said coded series of pulses;

decoding means connected to said sensing means for receiving said series of pulses and decoding code has been received; and



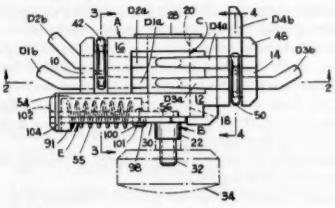
switching means connected to said decoding means operable to connect a loopback circuit to said communication circuit in response to the reception of the proper code said communication circuit including two pairs of wires and said switching means comprising a switch operable to connect said loopback circuit from one pair to the other pair and disconnect the remaining portion of the circuit.

3,922,509

ROTARY SWITCHES

Maurice Cyril Bryceland, Dover, N.J., assignor to Waldman Corporation, Parsippany, N.J.

Filed Feb. 7, 1974, Ser. No. 440,478
Int. Cl.[2] H01H *3/50, 21/50*
U.S. Cl. 200—11 R **32 Claims**



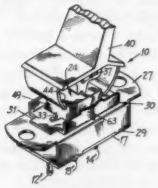
1. A switch comprising a frame, a rotatable member supported by the frame for rotation into four predetermined angular positions and having a rotor section with first and second conductors thereon, each of the conductors having surface portions in first and second circumferential bands of the rotor section, the conductor surface portions in the first circumferential band being cooperable with first and third spaced contact members supported by the frame and the conductor surface portions in the second circumferential band being cooperable with second and fourth spaced contact members supported by the frame for selectively electrically connecting said first and fourth contact members to the third contact member in the first position of the rotatable member, to the second and third contact members, respectively, in the second position of the rotatable member, to the second contact member in the third position of the rotatable member, and to the third and second contact members, respectively, in the fourth position of the rotatable member.

3,922,510

SNAP ACTION ROCKER SWITCH

Ronald H. Arthur, Fort Lauderdale, Fla., assignor to AMF Incorporated, White Plains, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,493
Int. Cl.[2] H01H *15/18*
U.S. Cl. 200—76 **5 Claims**



1. In an electrical switch having a plurality of stationary contacts disposed along a path and having a sliding contact movable along said path by a contact carrier for selectively engaging stationary contacts, said contact carrier being movable along said path between extreme switching positions by a rocker member which is pivotally mounted between side brackets that are fixedly mounted relative to said movable contact carrier, the improvement of spring means for providing a positive snap action to the pivoting of said rocker member and to the sliding of the contact carrier between its extreme switching positions, said means and action being provided without imparting additional contact pressure to the stationary and sliding contacts, said improvement comprising a compression spring mounted between said rocker member and at least one of said side brackets,

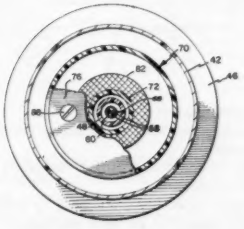
the location of the mounting of the spring to said rocker member falling on opposite sides of a plane passing through the pivotal axis of the rocker member and the location of the mounting of the spring to a bracket when the rocker member is pivoted to place the contact carrier in its extreme switching positions, thereby to provide an over-the-center snap action to rotation of the handle and the sliding of the contact carrier.

3,922,511

SPECIFIC GRAVITY MONITOR

Raymond A. Letize, Danbury, and James A. Johnson, Litchfield, both of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Filed May 3, 1973, Ser. No. 356,771
Int. Cl.[2] H01H *35/18*
U.S. Cl. 200—84 C **2 Claims**



1. A float actuated sensor adapted for total submersion in a liquid whose specific gravity is subject to change, said sensor being responsive to such changes in specific gravity above a predetermined minimum value and comprising in combination

a magnetically operated read switch, a toroidal float, a permanent ring magnet carried by said float and effective to actuate said switch in certain positions of said float relative to said switch, and an axial support structure for said float,

said support structure comprising an elongated tubular sleeve of non-magnetic material, and disc members removably secured to opposite ends of said sleeve and projecting peripherally therefrom,

said float comprising a closed hollow toroid, and said ring magnet being fixedly secured therein in concentric relation therewith, said float and magnet being axially received on said sleeve in free sliding relation thereto between said disc members, and said read switch being mounted internally of said sleeve in stationary relation thereto and having conductors leading out through at least one of said disc members for connecting said switch to an external electric circuit,

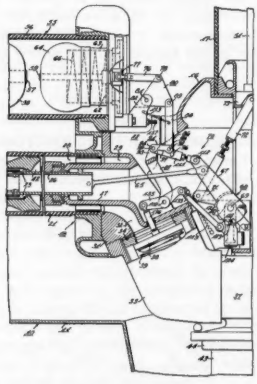
said float and magnet having a displacement volume and combined weight to produce an effective density approximately equal to that of the liquid at said predetermined minimum specific gravity value, said float further having an axial dimension substantially shorter than the length of said sleeve to allow sliding movement of the float to occur between said discs, said total displacement volume when expressed in cubic centimeters bearing a numerical ratio of at least **200:1** relative to said predetermined specific gravity value.

3,922,512

RESISTOR SWITCH SYNCHRONIZING OPERATING MECHANISM

George K. Benham, Somerville, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 19, 1974, Ser. No. 443,919
Int. Cl.² H01H *33/86*
U.S. Cl. 200—148 F **12 Claims**



1. In a circuit breaker;

a main switch comprising a stationary contact and a movable contact;

a secondary switch comprising a stationary contact and a movable contact;

resilient means operably connected to bias said movable secondary contact to an open position;

mechanical drive means operably connected to operate said main switch and said secondary switch including a drive crank movable between a first and second position for effecting the operation of said switches;

a drive linkage connection between said drive crank and said secondary switch and said main switch for imparting a closing force to said secondary switch movable contact when said drive crank moves from its first position to its second position, said drive linkage being operable to release the drive force of said mechanical drive means after said drive crank has operated to effect relative movement of said secondary switch movable contact to closed position and the movement of said movable main contact to a position of engagement with the associated stationary main contact as said drive crank continues to operate to move said movable main contact to a fully engaged position with said stationary main contact; and,

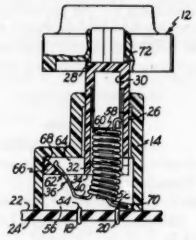
yieldable means operable upon said drive linkage to maintain said linkage in operable driving condition for transmitting switch closing movement of said drive crank to said secondary switch.

3,922,513

SWITCH APPARATUS HAVING IMPROVED MEANS FOR SEATING OF MOVABLE CONTACT MEMBER

Robert T. Kravchuck, Lincoln, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 5, 1973, Ser. No. 376,654
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H01H *13/52*
U.S. Cl. 200—159 R **12 Claims**



1. A keyboard switch comprising:

an electrically insulative base having opposed first and second surfaces and having a plurality of apertures extending from the first to the second surface;

a pair of electrically conductive generally U-shaped members, each member having two legs joined by a bight portion, each of the legs received in a respective aperture in the base with the bight portion disposed adjacent the first surface, the top of the bights extending a distance d above the first surface;

an elongated keybody having a force receiving end and a force transmitting end;

a housing disposed over the pair of U-shaped members, the housing having guide means and an end wall aligned with the U-shaped members, the keybody received in the guide means and movable therein toward and away from the U-shaped members;

a movable electrically conductive contact bridge member disposed in the housing generally intermediate the U-shaped members and the keybody, the movable contact member having a first free distal end operatively connected to the keybody so that sufficient movement of the keybody away from the U-shaped members lifts at least a portion of the movable contact member away from the U-shaped members, a spring seat formed on the movable contact member;

a coil spring extending from the keybody to the spring seat; the movable member having first and second contact sections adapted to engage the respective bight portions of the pair of U-shaped members, the movable member having a projection extending downwardly below the first and second contact sections by a distance less than d, the movable member having a second distal end, an outwardly and upwardly curved portion extending from the

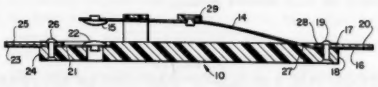
second distal end adapted to engage the end wall when its normal operating position, whereby upon dislodgement of the movable member from its normal operating position to a position with the second distal end removed from the end wall and located intermediate the pair of U-shaped members the end of the coil spring is displaced away from the end wall so that a righting moment is exerted on the movable member, movement of the keybody toward the U-shaped members increases the righting moment and causes the movable member to slide over the first surface and bight portion of one of the U-shaped members to its normal operating position.

3,922,514

STATIONARY STARTING WINDING SWITCH FOR ELECTRICAL MOTORS

Joseph Greenhut, 3333 Warrensville Center Road, Shaker Heights, Ohio

Filed May 16, 1974, Ser. No. 470,609
Int. Cl.² H01H *1/26*
U.S. Cl. 200—246 **13 Claims**



1. In a starting winding switch for an electrical motor, the combination of a dielectric base plate, an electro-conductive leaf spring secured to said base plate adjacent one end thereof and having said one end projecting beyond said securement, an electrical contact provided on the other end of said spring and yieldably urged to a switching position relatively to a second contact provided on said base plate, an electro-conductive arm of different material than the spring having at least twice the thickness of the spring secured to said leaf spring and extending in face-to-face abutment coextensively therewith from said one end to at least said securement, said securement being a fastener traversing said spring and arm and base plate, and said spring and arm at said one end being frictionally engageable by a slidable terminal connector to mechanically secure them in electrical contact with each other at a point spaced from and independent of said first-named securement.

3,922,515

TEMPERATURE COMPENSATED PRESSURE DIFFERENTIAL SENSING DEVICE WITH SWITCH ACTUATED BY PRESSURE CAPSULE

Daniel T. Meisenheimer, Jr., 404 Longmeadow Road, Orange, Conn. 06477

Filed Apr. 23, 1973, Ser. No. 353,466
Int. Cl.² H01H *35/32*
U.S. Cl. 200—83 S **7 Claims**

1. A pressure differential sensing device comprising:

a. a housing having a base, a cylindrical body portion extending upwardly therefrom, and a shank portion extending downwardly therefrom, the shank portion having a bore formed therethrough;

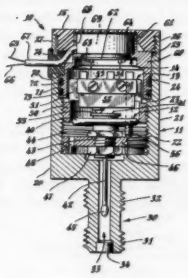
b. a mechanically operated switch including an actuating member mounted in the housing;

c. a flexible gas filled sealed capsule mounted within the housing, said capsule mounted to a first externally threaded collar which is fixed against rotation and free for axial movement with respect to the switch actuating member, said first collar mounted in mating interior threads of a second collar, said second collar constrained within the housing against movement along the axis of its interior threads and free for rotation about said axis, wherein rotation of said second collar causes movement of said first collar and the capsule mounted thereto for adjustably positioning the capsule relative to the actuating member of the switch;

d. signal means operated by the switch; and

e. means sealing the housing wherein the interior of the housing comprises a sealed cavity communicating with the exterior of the housing through the bore in the mounting shank;

wherein the device is attached to a pressurized chamber by means of the shank and wherein the initial internal pressurization of the capsule is chosen such that the capsule size remains substantially constant throughout a range of temperature variations causing pressure increases and decreases in both the capsule and the chamber, whereby a loss of gas from the chamber results in a decrease of the gas pressure of the chamber relative to the internal gas pressure of the capsule thereby permitting the capsule to expand, the expansion of the capsule operating the switch.

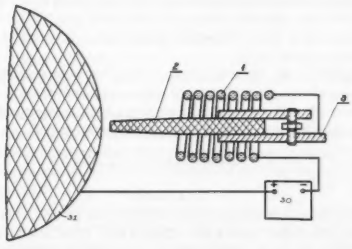


3,922,516

METHOD FOR PRODUCING PROTECTIVE COATINGS ON CARBON ELECTRODES

Alexander Jordanov Valtchev, and Emil Pantaleev Minov, both of Sofia, Bulgaria, assignors to Metalurgitchen Zavod "Lenin", Pernik, Bulgaria

Filed May 2, 1973, Ser. No. 356,351
Int. Cl.² B23K *9/04*
U.S. Cl. 219—76 **3 Claims**



1. A method of producing a coated carbon article, comprising the steps of applying aluminum coating material to a surface of a carbon article; sweeping a continuous electric arc across the surface coated with said material with an arc current of 1000 to 2500 amperes and a spacing between increments of passage of the arc over said surface of about 13 mm; and applying a magnetic field to said arc while sweeping same across said surface to stabilize the arc, said magnetic field having an axis substantially perpendicular to said surface and parallel to said arc and being generated by passing current through a coil substantially coaxial with said arc.

3,922,517
WELDING METHOD AND APPARATUS

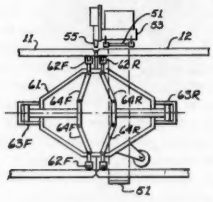
Jerome W. Nelson; Earl B. Nay; Eric W. Wittman, all of Houston, Tex., and Robert E. Pollock, deceased, late of Katy, Tex. (by Peggy Pollock, executrix), assignors to CRC-Crose International, Inc., Houston, Tex.

Filed June 25, 1973, Ser. No. 373,483

Claims priority, application United Kingdom, June 29, 1972, 30609/72

Int. Cl. B23k *31/06*

U.S. Cl. 219—61 **20 Claims**



1. A process for forming a first welding pass or stringer bead from the outside in a girth joint located between adjacent end portions of similar non-rotatable annular work members such as large pipes and the like, by fusing through substantially abutting wall thickness elements of said work members to fill a gap inside said substantially abutting elements, said process comprising, in combination, the steps of:

a. forming an inner bevel or V-gap surface, an outer gap surface, and an intermediate substantially plane-surfaced land element between said gap surfaces on said of said adjacent end portions,

b. holding said work member end portions in adjacent positions with said land elements facing each other and substantially in abutment with each other, thereby establishing an internal V-gap and an external gap around the joint between said work members end portions.

c. advancing a thin metal wire consumable electrode into said outer gap while concurrently traveling said electrode along said gap and during at least part of said traveling directing said wire electrode into said gap with a leading angle of at least 15 degrees with respect to a radius of said work pieces, and

d. applying an electric arc to said advancing and traveling wire electrode to fuse said wire and concurrently to fuse through said substantially abutting land elements, thereby to fill said inner V-gap with fused weld metal.

3,922,518
METHOD FOR MACHINING THROUGH INTERMITTENT PULSE-CONTROLLED ELECTRIC DISCHARGES

Jean Pfau, Geneva, Switzerland, assignor to Ateliers Charmilles, S.A., Geneva, Switzerland

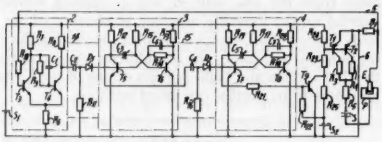
Filed Jan. 4, 1965, Ser. No. 423,237

Claims priority, application Switzerland, Feb. 25, 1964, 2295/64

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 M **6 Claims**

1. A method for machining a part by electric discharge between an electrode and said part comprising applying between said electrode and said part a succession of electric pulses having a voltage greater than the electric discharge voltage, and controlling the duration of each of said pulses as a function of the time delay between the application of each of said pulses and the commencement of the electric discharge between said electrode and said part to assure that an electric



discharge having a predetermined time interval of duration is obtained for each of said pulses.

3,922,519
METHOD FOR A BUILD-UP WELDING OF DIFFERENT METALS

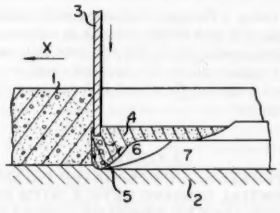
Katao Miyano; Shunichi Tomizuka; Takao Adachi, all of Muroran; Tomoo Takenouchi; Satoshi Kondo, both of Noboribetsu; Akira Hirama, and Yasuo Endo, both of Muroran, all of Japan, assignors to Japan Steel Works Ltd., Tokyo, Japan

Filed Feb. 6, 1974, Ser. No. 439,863

Claims priority, application Japan, June 19, 1973, 48-68303

Int. Cl.² B23K *9/04*

U.S. Cl. 219—76 **1 Claim**

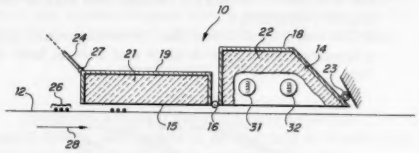


1. A method for build-up welding of different metals comprising the steps of uniformly distributing a flux powder on a base metal to be build-up welded disposed substantially horizontally, leading into said flux a consumable electrode in the form of a wide band, passing an electric current between said electrode being continuously fed towards the base metal to be build-up welded and said base metal, controlling the current density of said electrode such that it is between 7 and 60 A/mm², and controlling the current density of the electrode in the direction of its width such that it is between 10 and 23 A/mm as in the case of the build-up welding of a stainless steel on a mild or low-alloyed steel as the base metal; moving said electrode substantially horizontally in the direction perpendicular to the width of said electrode after said flux has been melted so that said flux, said electrode and said base metal are substantially continuously melted by the molten flux being heated by the Joule heat due to the electric current flowing therethrough, and thus melting said flux, said electrode and said base metal in such a manner that both said electrode and said base metal form a bead on the surface of the base metal.

3,922,520
HEATING APPARATUS FOR ELECTROPHOTOGRAPHIC COPIERS

Robert A. Moore, Amherst, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Feb. 19, 1974, Ser. No. 443,286
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **12 Claims**



1. In an electrophotographic copying system, heating apparatus for fusing a powder image on the surface of an image bearing support member carried thereacross, said heating apparatus comprising:

a. an active radiant energy heat source;

b. a passive radiant energy heat source, said passive radiant energy heat source comprising means for storing a substantial amount of heat energy applied thereto;

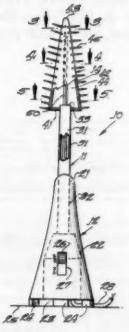
c. means for applying heat energy to said passive radiant energy heat source to be stored therein; and,

d. means for selectively releasing the heat energy stored within said passive radiant energy heat source and for directing radiant energy therefrom to said powder image for supplementing said active radiant energy heat source during periods when said active radiant energy heat source may supply insufficient heat to said powder image to effectively fuse it to the surface of said support member.

3,922,521
ELECTRIC HAIR CURLING IRON

Dennis L. Viegut, and Cherie Viegut, both of Appleton, Wis.

Filed Feb. 25, 1974, Ser. No. 445,154
Int. Cl. H05b *1/00*; A45d *1/04*
U.S. Cl. 219—222 **4 Claims**



1. A hair curling iron intended for producing waves and curls of selected different sizes in an individual's hair and comprising:

an elongated handle member having a top end, a bottom end, and surrounding side surfaces, a plurality of supporting members mounted on said bottom end and adapted to retain said handle in an upright storage position;

an elongated rod member having one end mounted to the top end of said handle with the opposite end projecting axially outwardly therefrom, said rod having a bore extending axially therethrough;

a conically shaped curling head having a base surface, an apex surface, and surrounding conically shaped side wall surfaces, said base surface being disposed adjacent said opposite end of said rod member and permanently affixed thereto, a plurality of hair guiding spines disposed about said side wall surfaces and projecting outwardly therefrom and adapted to guide strands of hair wrapped thereabout;

a heating element disposed in said curling head and adapted to heat the side wall surfaces thereof in a manner to rapidly dry hair wrapped thereabout;

an electric switch mounted in said handle and having an actuating member projecting exteriorly of said handle and movable selectively between an "on" and "off" position;

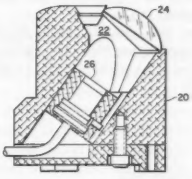
means electrically interconnecting said switch to said heating element; and

means adapted to electrically connect said switch to a source of electrical energy whereby operation of said switch will selectively energize and de-energize said heating element.

3,922,522
OPTICAL RECEIVER ASSEMBLY

Richard D. Anderson, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 510,457, Nov. 26, 1965, abandoned. This application Nov. 20, 1969, Ser. No. 886,606
Int. Cl.[3] H01J *3/14*
U.S. Cl. 250—216 **1 Claim**



1. An optical receiver assembly comprising:

a. a single cylindrical lens curved in two dimensions to form a field of view that is a sector of a cone,

b. a detector for detecting optical energy,

c. a housing in which said lens and detector are mounted to form a simple two dimensional energy collecting telescope with beam width equal to said detector dimension divided by the focal length,

d. the length of said lens having constant section with no optical power and being curved along its length with a radius equal to the focal length of the lens in the orthogonal plane,

e. the field of view being a sector of a disc of angular thickness defined by the beam width and the length of said lens having constant section is curved along its path while retaining a radius from the detector equal to the focal length.

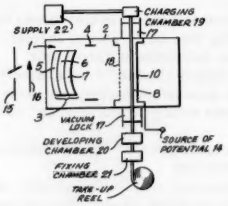
3,922,523
APPARATUS FOR PRODUCING X-RAY IMAGES AS RADIOGRAPHS

Edward Emanuel Sheldon, 30 E. 40 St., New York, N.Y. 10016

Filed May 16, 1973, Ser. No. 360,753
Int. Cl. G01n *23/04*
U.S. Cl. 250—320 **9 Claims**

1. An apparatus for medical radiography for X-ray examination of human body comprising in combination a vacuum tube

comprising an X-ray reactive screen producing in response to an X-ray image a beam of electrons corresponding to said image, image storage means receiving said beam of electrons and intensifying said beam, said image storage means comprising a layer of material exhibiting electron bombardment induced conductivity and an electrically conducting member, said image storage means being movable from the outside of



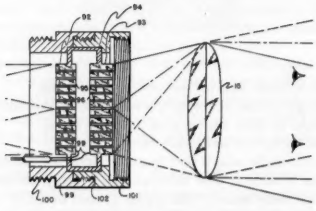
said tube into said tube and movable from said tube to the outside of said tube, said vacuum tube comprising in addition vacuum safety locks for protecting vacuum of said tube during removal of said image storage means from said tube, and means for converting said stored and intensified image moved outside of said vacuum tube into a visible image for inspection.

3,922,524

MODULAR BIOCULAR EYEPIECE FOR THERMAL IMAGE SYSTEMS

David K. Anderson, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 399,016, Sept. 20, 1973, Pat. No. 3,868,504. This application Nov. 15, 1974, Ser. No. 524,288
Int. Cl.[2] H01J *31/49, 31/50*
U.S. Cl. 250—330 **5 Claims**



1. In an infrared viewing system wherein an infrared image is converted to a low intensity visible image for direct monocular viewing; the improvement comprising:

a thin flat low-gain image intensifier mounted in said system with its input face substantially in the plane of said visible image; and

a biocular eyepiece having a focal length less than its diameter adjustably mounted at approximately said focal length distance from the output face of said intensifier.

3,922,525

BIDIRECTIONAL SPIROMETER

Zdenek Vaclav Kozak, and Joseph Jaromir Stupecky, both of North Hollywood, Calif., assignors to Zdenek Kozak

Filed May 13, 1974, Ser. No. 469,388
Int. Cl.[2] G01F *3/00*
U.S. Cl. 250—231 R **5 Claims**

1. A dual directional flow sensor comprising a body having an axial bore defining a fluid flow path therethrough;

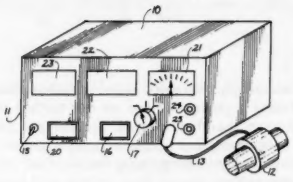
a turbine mounted for rotation by fluid passing through said bore;

said turbine including at least one blade;

first means for imparting a helical flow to fluid passing through said bore to drive said turbine blade in one direction for fluid flow through said bore in said one direction;

second means for imparting a helical flow to fluid passing through said bore to drive said turbine blade in the opposite direction for fluid flow through said bore in the said opposite direction;

said first and second helical flow imparting means defining a symetrical flow path through said bore in both directions;



a pair of movement sensors mounted adjacent to said bore and offset to the same side from the axis of said bore for detecting rotational movement of said turbine blades at different positions;

said movement detectors, each comprising a light emitter and a light detector aligned on a sector path through said bore and intercepting the rotational path of said turbine blade, the light paths of each of said movement detectors following sector paths through said bore on the same side of said axis and generally opposite direction; and

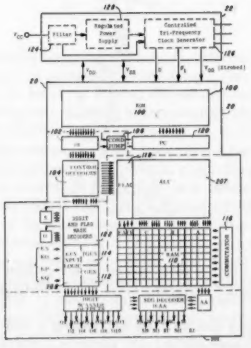
means responsive to the sequence of operation of said movement sensors for determining the direction of flow through said flow sensor.

3,922,526

DRIVER MEANS FOR LSI CALCULATOR TO REDUCE POWER CONSUMPTION

Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 2, 1973, Ser. No. 329,008
Int. Cl.[2] G06F *1/04*
U.S. Cl. 235—152 **10 Claims**



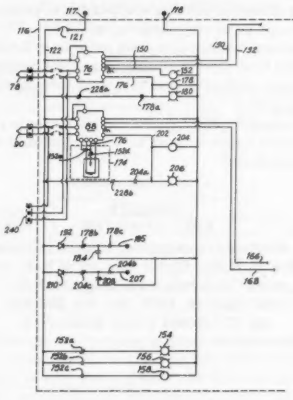
1. In an electronic data processing system having input means for generating input data upon input actuation, pro-

cessing means for manipulating the input data, output means for displaying manipulated data, and clock generator means for supplying system timing to the processing means and to the output means, the improvement wherein the clock generator means comprise means for generating a first relatively high frequency clock signal for a relatively short first time interval subsequent to data input through said input means, means for generating a second middle frequency clock signal for a longer preselected second time interval subsequent to said first time interval, and means for generating a third relatively low frequency clock signal subsequent to said second interval.

3,922,527
TEMPERATURE CONTROL APPARATUS

Donald E. Witkin, and Arnold G. Bowles, both of Warren, Pa., assignors to National Forge Company, Irvine, Pa.

Filed Dec. 26, 1974, Ser. No. 536,372
Int. Cl.² H05B *1/02*
U.S. Cl. 219—494 **11 Claims**



1. A temperature control apparatus for controlling a differential temperature between at least two locations in a system comprising

a first temperature sensing means for providing an output indicative of temperature at a first location,

a second temperature sensing means for providing an output indicative of temperature at a second location,

a temperature controller for providing an output signal responsive to the outputs of both the first and second temperature sensing means,

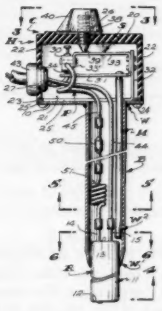
driver means responsive to the output signal of the temperature controller for applying a first variable amount of energy to a first heater element associated with said first location and for applying a second variable amount of energy to a second heater element associated with the second location, and

said driver means having a total energy output to said first and second heater elements which is substantially independent of the value of the output signal from the temperature controller.

3,922,528
THERMOSTAT HEATER

Walter V. Nickmeyer, Redlands, and Raymond L. Simmons, San Jacinto, both of Calif., assignors to Rama Corporation, San Jacinto, Calif.

Filed Mar. 10, 1975, Ser. No. 556,648
Int. Cl.² H05B *3/06*
U.S. Cl. 219—523 **9 Claims**



1. An electric resistance fluid heater unit comprising an elongate vertical metallic tubular body with open upper and lower ends and established of material having a high coefficient of expansion, an elongate vertical drive member extending longitudinally through the body with a lower end and fixed to the lower end portion of the tubular body, a free upper end and established of material having a substantially lower coefficient of expansion than the body, a cartridge-type electric resistance heater unit in sealed engagement with and closing the lower end of the body and having a pair of terminals accessible within the body, a power supply cord extending from the unit at the exterior of the body and engageable with a power source, a pair of elongate leads extending from the cord into the body at the upper end thereof and each connected with a heater terminal and an adjustable switch engaged in one of said leads and arranged in fixed position relative to the upper end of the body, said switch being operatively related to the upper end of the drive member whereby the switch is opened and closed in response to the vertical movement of the upper end of the drive member relative to the upper end of the body caused by thermal expansion and contraction of said body and member, said body and heater being insertable in a volume of fluid to be heated, and a case of dielectric material fixed to and closing the upper end of the tubular body and enclosing the switch, said case having an opening through which said cord extends.

3,922,529
STATIC READER FOR ENCODED RECORD

Leslie M. Orloff, Huntington, N.Y., assignor to Kenilworth Research & Development Corporation, Mineola, N.Y.

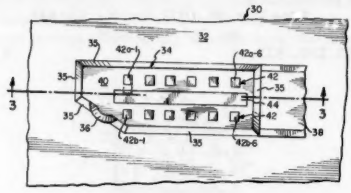
Filed Feb. 1, 1974, Ser. No. 438,675
Int. Cl.² G06K *7/06, 19/06*
U.S. Cl. 235—61.11 H **17 Claims**

1. A decoder comprising:

means for producing a radio frequency signal,

sensor platen means for supporting a record of the type having a pattern of spaced electrically unconnected bits of information thereon of a material which can electrically couple the radio frequency signal and in which said bits are covered by an electrically non-conductive material, said sensor platen means including a common first means for receiving the signal from the signal producing means and a plurality of second means adjacent but spaced from the first means in the same plane, each of said second means being located adjacent said first means

so that a bit present on the record will bridge the first means and a respective second means to electrically couple the signal from said first means to a second means which is bridged by a bit,



and means electrically coupled to said second means for detecting the signal coupled from said first to said second means.

3,922,530

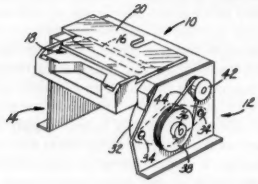
MAGNETIC STRIPE READING HEAD

Anton Z. Zupancic, Cleveland, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 256,231, May 24, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 456,028

Int. Cl.² G06K *7/15;* **G11B** *19/24;* **H02K** *21/12;* **G06K** *13/08*

U.S. Cl. 235—61.11 R **8 Claims**



1. Apparatus for driving a first member magnetic stripe encoded identification card and a second member read head in a transversely relative motion substantially free of speed variations, said apparatus including:

a rotary element adapted to impart a driving force to at least one of said first and second members;

a heavy flywheel pulley drivingly connected with said rotary drive element;

a permanent magnet synchronous motor having a pulley of little mass in comparison to said flywheel pulley carried on the output shaft thereof; and,

an elastic belt drivingly interconnecting said lightweight pulley and said pulley-flywheel;

whereby, a synchronous motor having a cogging character may be caused to deliver an average and uniform drive to said drive shaft.

3,922,531

FLEXITIME RECORDER

Erich Willmann, Zell (Neckar), and Reinhard Müller, Esslingen (Neckar), both of Germany, assignors to Simplex Time Recorder Co., Gardner, Mass.

Filed July 23, 1974, Ser. No. 491,067

Claims priority, application Germany, July 25, 1973, 2337711

Int. Cl.² G04F *11/06*

U.S. Cl. 235—92 T **10 Claims**

1. A flexitime recorder comprising:

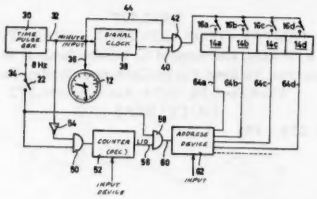
timing pulse generating means for generating timing pulses at a first frequency;

a plurality of pulse-actuated time store counting means for counting said timing pulses;

a plurality of switch means for controlling the time registered in respective said time store counting means in accordance with the in-time of persons with whom the individual time store counting means are associated;

correction pulse generating means for generating correction pulses at a frequency substantially higher than said first frequency, for transmission to a said time store counting means to correct the time registered therein;

pulse train limiting means associated with said correction pulse generating means, for allowing a predetermined



number of pulses to be transmitted from said correction pulse generating means to said time store counting means;

adjusting means for altering said number of pulses transmitted by said pulse train limiting means;

address means connected to said pulse train limiting means and said time store counting means, for permitting said correction pulses to pass to a said time store counting means; and

altering means for altering said address means to permit said correction pulses to pass to a different said time store counting means.

3,922,532

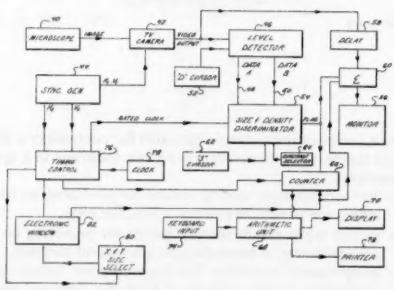
CELL COUNTER

William R. Kitchener, Huntington; Stephen L. Sama, Seaford, and Walter E. Tolles, Oyster Bay, all of N.Y., assignors to Artek Systems Corporation, Farmingdale, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,486

Int. Cl.² G06M *11/02;* **H04N** *7/18*

U.S. Cl. 235—150.3 **20 Claims**



1. A cell counting apparatus for counting cells contained in a sample, comprising:

a. video means focused onto the sample for providing a video output of the sample as a sequence of horizontal scan lines;

b. level detector means receiving the video output from the video means and for each scan line, providing a first signal containing all of the quantized image information of the cells scanned on that line, and a second signal containing the quantized image information of the cells

scanned on that line having absorptions greater than preselected absorption levels;

c. absorption selection means coupled to said level detector for setting said preselected absorption level;

d. discriminator means receiving said first and second signals from said level detector, providing therefrom a size and absorption information signal, comparing the last mentioned with preselected size levels, and in accordance with a preselected combination of size and absorption factors, producing a flag output in response to said comparison;

e. size selection means coupled to said discriminator means for setting said preselected size level;

f. counting means coupled to said discriminator means for counting the number of flag outputs produced; and

g. timing control means for synchronizing the operation of said discriminator means with said video means.

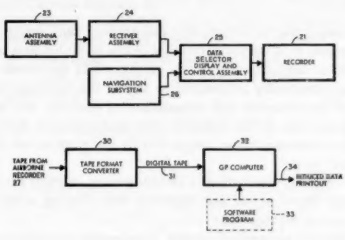
3,922,533
METHOD OF LOCATING A RADIATING TARGET

Douglas E. Royal, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 453,900, March 22, 1974, abandoned, which is a continuation of Ser. No. 281,319, Aug. 17, 1972, abandoned. This application Jan. 28, 1975, Ser. No. 544,726

Int. Cl.² G01S *5/06;* **G06F** *15/50*

U.S. Cl. 235—150.27 **14 Claims**



1. The method of locating a target radiating a wave, comprising a moving platform carrying equipment for moving the platform, obtaining bearing angle, heading and location data, and additional equipment for operating upon the data including identifying identical bearing angles, the method comprising the steps of:

a. moving the platform along an arbitrary flight path in the vicinity of the target;

b. recording by means of the radiated wave for different positions of the platform along the flight path relative bearing angles to the target which may contain large errors;

c. recording for different positions of the platform the heating thereof with respect to a known point;

d. recording for different positions of the platform the location thereof with respect to a known landmark;

e. identifying a first and a second position of the platform having a first and a second relative bearing angle with respect to the target;

f. calculating, based on the bearing, heading and location data of the first and second positions, a portion of a first circle passing through the first and second positions of the platform and the target, the first circle being calculated from the distance between the first and second positions and the included angle from the first and second positions to the target;

g. identifying a third and a fourth position of the platform having a third and a fourth relative bearing angle with respect to the target, the second relative bearing angle being determinable from the first relative bearing angle and the fourth relative bearing angle being determinable from the third relative bearing angle; and

h. calculating, based on the bearing, heading and location data of the third and fourth positions a portion of a second circle passing through the third and fourth positions of the platform and the target, the second circle being calculated by the distance between the third and fourth positions and the included angle from the third and fourth positions to the target, whereby the target location is determined by the intersection of the two circle portions.

3,922,534
METHOD AND ARRANGEMENT FOR MEASURING THE PULSE SEQUENCE FREQUENCY OF A PULSE SEQUENCE

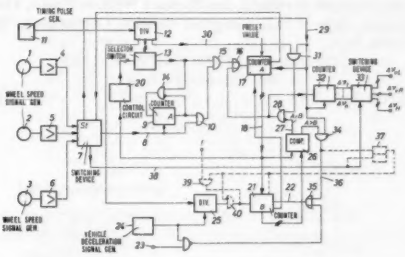
Jurgen Gerstenmeier, Leimen, and Wolfgang Korasiak, Ketsch, both of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Aug. 5, 1974, Ser. No. 494,858

Claims priority, application Germany, Aug. 7, 1973, 2339839

Int. Cl.² G06F *15/20*

U.S. Cl. 235—151.32 **26 Claims**



1. A method of measuring the pulse sequence frequency of a first pulse sequence comprising producing a pulse quantity in the duration of the period of a pulse of said first pulse sequence or a time dependent thereon using a second pulse sequence of higher frequency than said first pulse sequence and varying the pulse frequency of said second pulse sequence from an initial predetermined frequency during said period of a pulse of said first pulse sequence or a time dependent thereon according, at least approximately, to the reciprocal of the square of said period of a pulse of said first pulse sequence or a time dependent thereon.

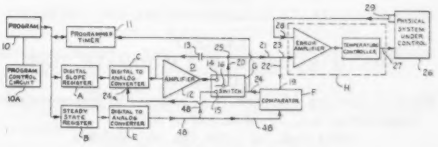
3,922,535
PROCESS CONTROL APPARATUS FOR TEMPERATURE CONTROL

John H. Randolph, Greenville, S.C., assignor to Courtaulds Engineering Limited, Coventry, England

Filed Nov. 12, 1970, Ser. No. 88,588

Int. Cl.² G05D *23/00*

U.S. Cl. 235—151.1 **10 Claims**



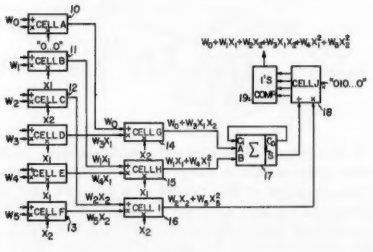
1. An apparatus for controlling the operation process of a system according to a predetermined operating cycle comprising a first means providing a slope signal representing a rate

of change that said process is to be varied during said operating cycle, an integrator coupled to said first means for generating an integrated signal having an amplitude proportional to the time integral of said slope signal, second means providing a steady state signal representing the end point of said operating cycle, a comparator, means for supplying said integrated signal to said comparator, means for supplying said steady state signal representing said end point to said comparator to be compared with said integrated signal, said comparator including means for generating a compared signal indicating whether said integrated signal is as large as said steady state signal, a switching circuit having an output, a controller coupled between said output of said switching circuit and said physical system, means for coupling said means to said switching circuit, means for coupling said integrator to said switching circuit, means for coupling said comparator to said switching circuit for causing said switching circuit to couple either said integrated signal or said steady state signal representing said end point to said controller, and said controller varying the operation of said physical system according to said signal supplied thereto.

3,922,536
MULTIONOMIAL PROCESSOR SYSTEM

Daniel Hampel, Westfield, and Richard William Blasco, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,132
Int. Cl.² G06F *15/34*
U.S. Cl. 235—152 **3 Claims**



1. A circuit for evaluating arbitrarily complex multinomial expressions comprising in combination:

a plurality of multiplier-added cells, each cell having three input ports for receiving electrical signals representing, respectively, a multiplicand, a multiplier, and an addend, and an output port for producing electrical output signals representing the product of the multiplier and multiplicand which product is added to the addend;

a plurality of selector means coupled to receive electrical input signals, representing variables and coefficients, for coupling the input signals to the input ports of each cell in response to control signals; and

control means for applying said control signals to said selector means to produce the desired multinomial values at the output ports of said cells.

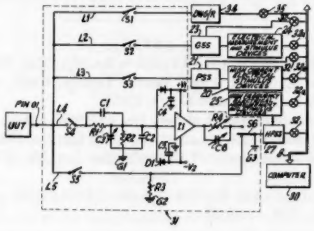
3,922,537
MULTIPLEX DEVICE FOR AUTOMATIC TEST EQUIPMENT

Philip C. Jackson, Mahwah, N.J., assignor to Instrumentation Engineering, Inc., Franklin Lakes, N.J.

Filed Sept. 26, 1974, Ser. No. 509,992
Int. Cl.² G01R *31/28*
U.S. Cl. 235—153 AC **13 Claims**

1. Multiplex apparatus for use in automated diagnostic testing systems having electrical stimulus and measurement devices for the testing of an electrical UUT having at least four terminals comprising:

a. plural conductor means, each of said plural conductor means comprising plural electrical signal routes and adapted for unique association with one of said at least four UUT terminals, for establishing a circuit connection between each of said plural terminals of the UUT and a selected one of at least two respective test points associated with each such conductor means, at least two of said plural electrical signal routes of each of said plural conductor means having differing current transmission capability, and each of said plural electrical signal routes being for establishing a circuit connection between the associated UUT terminal and one of the at least two test points associated with its conductor means;



b. means for automatically connecting said respective test points to separate terminals of the stimulus and measurement devices so that any of said UUT terminals may be automatically connected to any of the spearate terminals of the stimulus and measurement devices, and so that a given one of the stimulus and measurement devices may simultaneously be connected to any number of the UUT terminals;

c. computer controllable switch means in each said electrical signal route for opening and closing each of said circuit connections;

d. device controller means responsive to electrical computer command signals for operating said switch means in accordance with said computer command signals; and

e. computer control means in electrical connection with said device controller means for generating said electrical command signals.

3,922,538
CALCULATOR SYSTEM FEATURING RELATIVE PROGRAM MEMORY

Michael J. Cochran, Richardson, and Charles P. Grant, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 13, 1973, Ser. No. 396,902
Int. Cl.² G06F *9/20*
U.S. Cl. 235—156 **10 Claims**

1. A portable electronic calculator system having keyboard entry means and a system clock for providing timing cycles, comprising:

a. permanent store instruction memory means for storing a plurality of instructions;

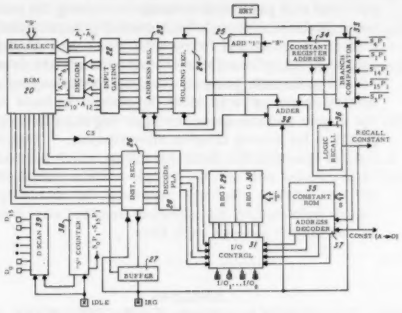
b. addressing means for addressing a particular location in the memory to procure an instruction word, and for storing the current address;

c. control word generating means for providing a multi-bit control word;

d. comparison means, for comparing a specified portion of the instruction word with a specified portion of the control word; and

e. address modifying means operatively connected to the addressing means and responsive to one condition of the comparison means for adding or subtracting a predeter-

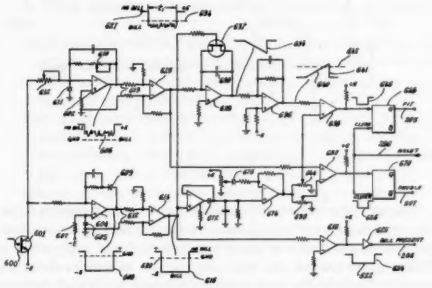
mined number to or from, respectively, the current address, the address modifying means including incrementing means, responsive to another condition of the comparison means, for incrementing the current address by a fixed increment.



3,922,539
IMPROVED CIRCUIT FOR DETECTING THE PASSAGE OF AN ARTICLE BEARING A REPETITIVE MARKING

W. Robert Carnes, Darien; John J. Balogh, Jr., Trumbull, and Lester L. Selnick, Ridgefield, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 2, 1974, Ser. No. 457,395
Int. Cl.[2] G06G *7/18*; **G06K** *19/06*
U.S. Cl. 235—183 **4 Claims**



1. A circuit arrangement for detecting the passage of an article bearing a repetitive marking adapted to repetitively alter the reflectance of light impinging on the marking as the article is transported through an examination station, comprising:

a first circuit means including a photosensitive device positioned at the examination station for receiving light which is reflected from an article being transported through the station, said first circuit means generating an alternating signal as the article is transported through the station, said signal having a frequency corresponding to a frequency of the repetitive markings on the article;

integrating circuit means operatively connected to said first circuit means for providing an output signal during the transit of an article having no repetitive marking thereon through the examination station, and for providing substantially no output signal during the transit of an article having a repetitive marking thereon through the examination station;

a second circuit means for providing a signal for disabling said integrating circuit means in the absence of an article at the examination station, and for enabling the integrating circuit means to provide the integral of said alternating signal during the transit of said article through the examination station;

comparator circuit means having first and second input terminals, said comparator circuit means providing a first DC output level when the amplitude of a signal applied to said first input terminal is less than the amplitude of a reference signal applied to said second input terminal;

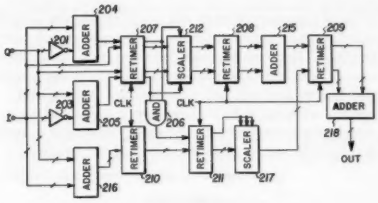
interconnecting means for applying the integrated signal from said integrating means to the first terminal of said comparator; and

means for applying a reference signal to said second input terminal of said comparator.

3,922,540
APPROXIMATOR FOR SQUARE ROOT OF SUMS OF SQUARES

John Albert Lunsford, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,717
Int. Cl.[2] G06F *7/38*; **G06G** *7/20*, *7/22*
U.S. Cl. 235—193.5 **5 Claims**



1. The combination comprising:

source means for providing first and second input magnitude signals;

comparing means responsive to said first and second input signals for producing a first signal indicating that said second input signal is greater than half of said first input signal and a second signal indicating that said first input signal is greater than half of said second input signal;

summing means responsive to the source means for producing an output signal representing half the sum of said first and second input signals; and

means responsive to the comparing means and to the summing means for producing an output signal representing the value of said first input signal plus one-fourth the second input signal when said first signal from said comparing means is present and said second signal from said comparing means is absent, representing the value of said second input signal plus one-fourth the value of said second input signal when said first signal from said comparing means is absent and said second signal from said comparing means is present, and representing the value of three-fourths the sum of said first and second input signals when both said first signal and said second signal from said comparing means are present.

3,922,541
METHODS AND APPARATUS FOR STABILIZING THE GAIN OF A RADIATION DETECTOR

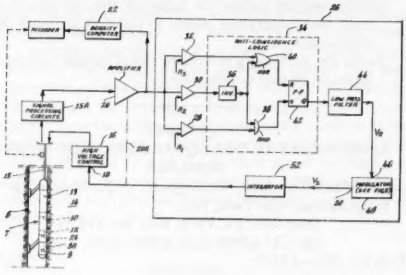
Bronislav Seeman, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 21, 1973, Ser. No. 427,110
Claims priority, application France, Dec. 21, 1972, 72.45585
Int. Cl. G01v *5/00*; **G01t** *1/20*
U.S. Cl. 250—256 **20 Claims**

1. Earth formation exploring apparatus for stabilizing the gain of a radiation detector, comprising:

a. an earth formation exploring means for carrying radiation source means for irradiating an earth formation with radiation, a nearby detector means for detecting radiation and producing signals representative thereof, and reference radiation source means for emitting radiation having a predetermined energy spectrum;

b. means responsive to said signals for selecting only those of said produced signals which represent energies within



a range representative of the range of said predetermined energy spectrum to produce a reference signal representative of the relationship between said predetermined energy spectrum from the reference radiation source and the energy spectrum of said selected signals; and

c. means responsive to said reference signal for applying a non-linear correction to said detector means to maintain a relatively stable gain for said detector means.

3,922,542

DEVICE FOR THE CONTINUOUS ANALYSIS OF SAMPLES ESPECIALLY BY NON-DISPERSIVE X-RAY FLUORESCENCE

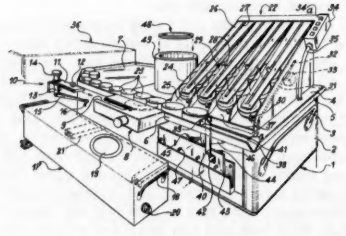
Jean-Claude Tanguy, Athis Mons, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 22, 1974, Ser. No. 435,592

Claims priority, application France, Jan. 30, 1973, 73.03211

Int. Cl. G01m *21/00*

U.S. Cl. 250—277 **13 Claims**



1. A device for the continuous analysis of samples especially by non-dispersive x-ray fluorescence analysis, comprising a measuring head constituted by a removable sealed radioactive source and a counting assembly connected to a radiation detector receiving x-radiation re-emitted by the sample having a plane entrance window which delimits with the source a space of small thickness reserved for the positioning of successive flat filters of identical shape, wherein said device comprises:

a sequential filter-transfer unit comprising a conveyor driven in reciprocating motion between a first position in which a filter is brought into the space formed between the source and the detector and a second position in which the filter aforesaid is integrated in a stack formed by all the filters,

a sample-transfer unit comprising an inclined transfer rack provided with parallel slide-ramps containing the samples to be analyzed, a trough for receiving groups of samples formed by one sample from each slide-ramp, a push-plate for the group of samples within the trough, the function of said push-plate being to cause said samples to pass in unitary sequence in front of the measuring head above the source and the space for receiving the filters, and a platform for storing samples after analysis,

a control assembly for the mechanisms which actuate the filter-transfer unit and the sample-transfer sample-transfer unit and an electronic assembly for recording the signals delivered by the radiation detector after analysis of one sample through each filter.

3,922,543

ION CYCLOTRON RESONANCE SPECTROMETER AND METHOD

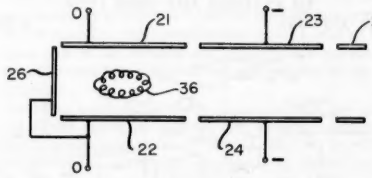
Jesse L. Beauchamp, 1780 San Pasqual, Pasadena, Calif. 91109

Continuation of Ser. No. 298,341, Oct. 17, 1972, abandoned. This application Mar. 28, 1974, Ser. No. 455,520

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B01D *59/44*

U.S. Cl. 250—291 **8 Claims**



1. In an ion cyclotron resonance spectrometer, means forming an ion source region, means for ionizing gaseous substances within said ion source region to form a plurality of different ion species, an analyzing region, means for directing a magnetic field through said source and analyzing regions, means for applying static electric fields to said source region and analyzing region which together create a potential configuration with equi-potential lines which close themselves within the source region and which together with said magnetic field serves to constrain the different ion species to move in said source region on said equi-potential lines to remain in the source region for the same predetermined time, means for thereafter applying electric fields to said source and analyzing regions which together create a potential configuration which releases said different ion species after said predetermined time and causes them to drift from said source region through said analyzing region, and means for detecting the different ion species as they drift through the analyzing region.

8. The method of measuring ion intensity of constituents in a reaction comprises forming different ion species by impacting a pulse of electrons on a gas to be analyzed in an ion source region, constraining said different ion species so that they move only in said source region for the same predetermined period of time and then allowing the ions to drift from the source region through an analyzing region of an ion cyclotron resonance spectrometer to measure the signal intensity of each of said ion species.

3,922,544

DEVICE FOR SEPARATION OF SPUTTERED NEUTRALS AND HIGH ENERGY IONS FROM SPUTTERED LOW ENERGY IONS

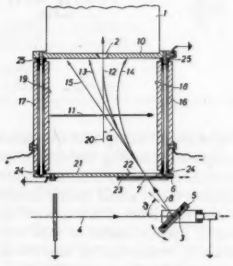
Johann Maul, Westerholzhausen near Munich; Friedrich Schulz, and Klaus Wittmaack, both of Munich, all of Germany, assignors to Gesellschaft fur Strahlen-und Umweltforschung mbH, Munich, Neuherberg, Germany

Filed May 2, 1973, Ser. No. 356,313

Claims priority, application Germany, Sept. 1, 1972, 2242987

Int. Cl. H01j *39/00*

U.S. Cl. 250—296 **6 Claims**



1. Mass spectrometer apparatus comprising, in combination:

mass analyzer means including a front panel provided with an entrance aperture and defining a longitudinal ion input path passing through said aperture and extending transverse to said front panel;

means for supporting a target electrode arranged to carry a sample to be tested for permitting the sample to be struck by a primary ion beam at a point laterally offset from said ion input path for producing particles by sputtering;

shutter means presenting a beam-defining aperture for the passage of a beam of such particles from said sample, said beam defining aperture being positioned such that the straight line between the point at which the primary ion beam strikes the sample and the center of said beam-defining aperture intersects said front panel at a point outside the region enclosed by said entrance aperture and intersects the line defining said longitudinal ion input path at a point between said front panel and said shutter means; and

means for producing an electric field in the region between said shutter means and said front panel to deflect the low energy ions in said beam of particles through said entrance aperture and along said ion input path, said electric field producing means including a pair of electrodes disposed between said front panel and said shutter means and located to respectively opposite sides of the line defining said longitudinal input path, said electrodes being spaced from the straight-line path between the center of said beam-defining aperture and the point where said front panel is intersected by said straight line between the point where the primary ion beam strikes the sample and the center of said beam-defining aperture, whereby neutral particles and high energy ions passing through said beam-defining aperture strike said front panel outside the region enclosed by said entrance aperture and are thus prevented from entering said mass analyzer means.

3,922,545

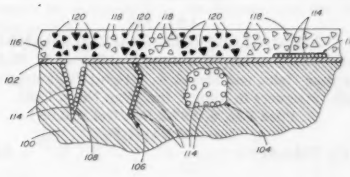
PROCESS FOR NONDESTRUCTIVELY TESTING WITH A DESENSITIZED SILVER HALIDE RADIOGRAPHIC LAYER

Carl B. Gibbons, Columbus, Ohio; Martha H. Sewell, Rochester, and Robert C. Taber, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 26, 1974, Ser. No. 446,050

Int. Cl. G21h *5/02*

U.S. Cl. 250—303 **20 Claims**



1. A method of nondestructively testing an article for substantially invisible voids adjacent its surface comprising:

a. bringing a radioactive gas into contact with the surface of the article being tested,

b. retaining by adsorption the radioactive gas on those surfaces presented by the substantially invisible voids and at other locations adjacent the surface,

c. juxtaposing a silver halide radiographic layer adjacent the surface being tested, and

d. preferentially recording within the silver halide radiographic layer the location of the radioactive gas adsorbed within the substantially invisible voids.

3,922,546

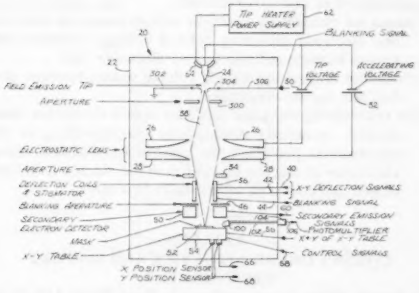
ELECTRON BEAM PATTERN GENERATOR

William R. Livesay, Camarillo, Calif., assignor to Radiant Energy Systems, Inc., Newbury Park, Calif.

Continuation-in-part of Ser. No. 244,078, April 14, 1972, abandoned. This application Mar. 5, 1974, Ser. No. 448,283

Int. Cl.² G01N *23/00*

U.S. Cl. 250—310 **23 Claims**



1. In an electron beam pattern generator, the apparatus comprising:

means for supporting a target;

an electron emitting means for emitting electrons substantially as a result of field emission due to the presence of a strong electrostatic field;

means for subjecting said emitting means to a strong electrostatic field to cause field emission therefrom and to accelerate said electrons generally in a beam and toward said target;

means for focusing said beam onto said target;

deflection means for accurately deflecting said beam within a controllable range in response to deflection control signals;

blanking means for deflecting said beam beyond said controllable range and onto a beam intercepting member to prevent impingement of said beam on said target in response to an electrical blanking signal; and

means for heating said emitting means substantially continuously, thereby improving long-term stability of said beam.

3,922,547

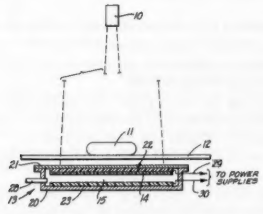
VIRTUAL ELECTRODE IMAGING CHAMBER

Andrew P. Proudian, Chatsworth; Murray S. Welkowsky, Sherman Oaks, and Steven A. Wright, Playa del Rey, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Dec. 6, 1974, Ser. No. 530,057

Int. Cl.² B41M *5/00*

U.S. Cl. 250—315 A **24 Claims**



1. In an imaging chamber for an x-ray system, the combination of:

first and second substantially planar electrodes;

means for mounting said electrodes in the chamber in spaced relation defining a gap therebetween;

each of said electrodes having an electrical insulating substrate with a low conductivity surface at said gap and means defining a plurality of spaced locations along the surface;

means for connecting a first voltage source to said first electrode providing defined voltages between said spaced locations of said first electrode;

means for connecting a second voltage source to said second electrode providing defined voltages between said spaced locations of said second electrode; and

means for connecting a third voltage source between said first and second electrodes

for maintaining along said surfaces of said electrodes, electrostatic potentials substantially corresponding to the electrostatic potentials for concentric spherical metal electrodes so that the extensions of the electric field lines in said gap converge substantially to a point.

3,922,548

CORONA CHARGING DEVICE AND SUPPORT ARRANGEMENT

Ko Honda, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

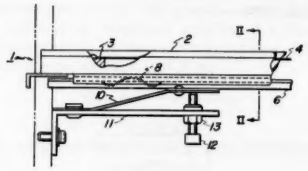
Filed Mar. 15, 1974, Ser. No. 451,630

Claims priority, application Japan, May 18, 1973, 48-157831

Int. Cl.² H01T *19/04*

U.S. Cl. 250—324 **1 Claim**

1. In combination, a corona charging device comprising an elongated shield defining a chamber generally concave in cross section and having an opening on one side thereof and a wire electrode supported along the longitudinal axis of said shield by insulating blocks supported at opposed ends of said shield, an imaging surface adjacent said opening and adapted to be charged by said device, a support arrangement for permitting movement of said device in directions parallel and perpendicular to said axis, said arrangement including a rail extending parallel to the longitudinal axis of said shield, said rail including outwardly diverging flanges, said shield including a channel on the side thereof opposite said opening, said flanges interfitting into said channel so as to permit sliding



movement of said shield along said rail generally parallel to said axis, a compression spring interposed between said rail and said device to continuously bias said shield away from said rail, a fixed support base, a leaf spring coupled intermediate said base and said rail, a set screw carried by said base, said set screw movable perpendicular to said axis for flexing said leaf spring, whereby movement of said device in a direction perpendicular to said axis is accomplished.

3,922,549

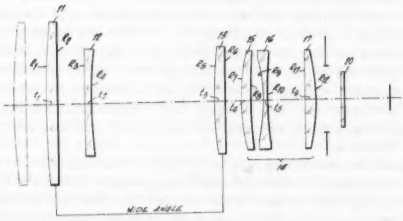
FOG PENETRATING VIEWING SYSTEM

Frank G. Back, 55 Sea Cliff Ave., Glen Cove, N.Y. 11542

Filed June 17, 1974, Ser. No. 479,648

Int. Cl.² G02B *23/12*, *15/14*, *13/16*

U.S. Cl. 250—330 **1 Claim**



1. A fog penetrating viewing system comprising in combination, a varifocal lens system having a high *f*/number, monochromatically corrected at 11 microns to receive light from fog enveloped objects, a band pass filter to receive the light coming through the lens system and transmit only the wavelengths between 10.5 and 11.5 microns, a pictorial detector sensitive to a wave band between 10 and 12 microns to receive the light from the band pass filter, and means to convert the pictorial detector output into a visible image, in which the varifocal lens system has the following characteristics:

Lens No.	Radius R in mm	Thickness (t) Air Spacing (s)	Index of Refraction ND
Front Lens			
11	R_1= +570.17 R_2= −3159.56	t_1= 7.0 s_1= 84.6 (17.4)	4.00
Erector			
12	R_3= −1253.83 R_4= −244.67	t_2= 4.4 s_2= 10.4 (79.6)	4.00
Variator Lens			
13	R_5= +286.39 R_6= +4044.19	t_3= 7.0 s_3= 76.8 (9.8)	4.00
Relay			
15	R_7= +124.41 R_8= −715.04	t_4= 7.0 s_4= 7.2	4.00
16	R_9= −108.09 R_{10}=−421.60	t_5= 2.8 s_5= 23.0	4.00
17	R_{11}=−3159.56 R_{12}=+ 130.09	t_6= 7.0 s_6= 46.1	4.00

In the above table, the symbols designate the following:

ND is the refractive index for germanium,

R_1 to R_{12} are the respective radii of refractive lens surfaces numbered from front to rear of the lens system,

t_1 to t_6 are the respective axial thicknesses,

s_1 to s_6 are the respective separations from the front to the rear of the lens systems in the telephoto position,

Equivalent focal length of the whole system (EFL)=f= 40–130 mm,

Back focal length from the last lens element to the focal plane = 46.1 mm,

Travel of the front lens = 13 mm for focusing and 67 mm for zooming,

Radius, thickness, and separation in millimeters.

3,922,550

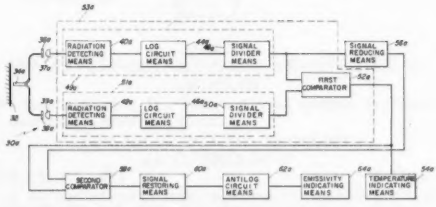
RADIOMETRIC SYSTEM

Arnold H. Crowley, Weston; Allan G. Dunn, Holbrook, and Edward A. Scharfenberger, Sudbury, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 28, 1973, Ser. No. 429,462

Int. Cl.² G01J *1/00, 5/00*

U.S. Cl. 250—338 **21 Claims**



1. A radiometric system for simultaneously measuring the temperature and the emissivity of a radiating body in accordance with theoretical data derived for an ideal linear detector, the system comprising:

idealized ratio pyrometer means for generating two idealized brightness pyrometer signals in response to radiation received from the radiating body, each of the brightness pyrometer signals having respective components related to an associated constant factor, emissivity, and temperature of the radiating body, and producing an idealized ratio output signal independent of emissivity and indicative of the temperature of the radiating body; and

emissivity circuit means operatively connected to the ratio pyrometer means for comparing the ratio output signal with one of the brightness pyrometer signals, and producing an output signal independent of the temperature and indicative of the emissivity of the radiating body.

3,922,551

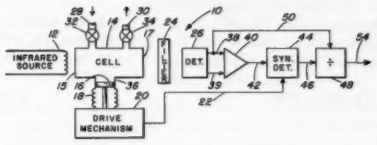
DETECTION OF CO_2 IN A HYPERBARIC GASEOUS ENVIRONMENT

Kevin G. Williams, Pinole, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 27, 1974, Ser. No. 509,872

Int. Cl.² G01M *21/26*

U.S. Cl. 250—343 **5 Claims**



1. A method of detecting CO_2 in a hyperbaric gaseous environment, comprising the following steps:

trapping a fixed amount of gas within a chamber set within a variable high-pressure environment;

projecting infrared radiation through the chamber;

subjecting the trapped gas to density modulation, and obtaining a modulation signal respresentative of the frequency of said density modulation;

detecting the radiation siganl passing through said gas;

comparing said detected radiation signal to said modulation signal to produce a modulated ac component of radiation determinative of the gas concentration of CO_2.

3,922,552

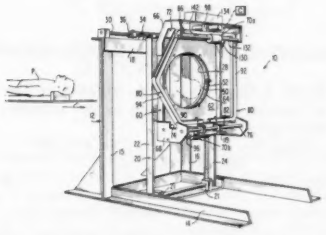
DIAGNOSTIC X-RAY SYSTEMS

Robert S. Ledley, 1002 La Granda Rd., Silver Spring, Md. 20903

Filed Feb. 15, 1974, Ser. No. 443,042

Int. Cl.² G01T *1/20*

U.S. Cl. 250—369 **16 Claims**



1. An improved diagnostic medical machine utilizing beams of radiation of small cross-sectional diameter for the purpose of mapping cross-sections of interior areas of the human body in combination with a computer, comprising,

a table for supporting a patient in a generally horizontal position,

a generally vertical first frame having an opening therethrough of a size sufficiently large to permit the patient and said table to move therethrough,

a carrier frame rotatably mounted on said first frame and having a second opening generally coextensive with said first opening,

a source of beamed radiation,
a collector to receive said beams of radiation,
first means mounting said source and collector to said carrier frame for translational movement with respect to said carrier,
second means for rotating said carrier about said patent, and
third means for tilting said first frame with respect to said patient.

3,922,553

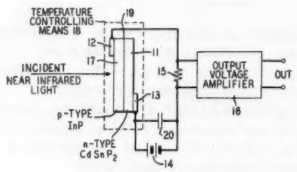
NEAR-INFRARED LIGHT EMITTING DIODES AND DETECTORS EMPLOYING $CdSnP_2$:InP HETERODIODES

Klaus Jurgen Bachmann, Piscataway; Ernest Buehler, Chatham; Joseph Leo Shay, Marlboro, and Jack Harry Wernick, Madison, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 382,021, July 23, 1973, which is a continuation-in-part of Ser. No. 315,359, Dec. 15, 1972, abandoned. This application Aug. 21, 1974, Ser. No. 499,172

Int. Cl.[2] H01L *29/161*; G01T *1/22*

U.S. Cl. 250—370 **8 Claims**



1. A detector for near-infrared radiation of the type comprising a crystalline body of $CdSnP_2$ in which said radiation can be absorbed and means including electrodes attached to said device for coupling an electrical response out of said device in response to the incidence of said radiation on said body, said detector being improved in that it includes an InP crystal oriented with respect to said body to intercept said radiation first, said crystal and said body forming a heterojunction near which said radiation is absorbed, one of said electrodes being attached to said InP crystal and another of said electrodes being attached to said $CdSnP_2$ body for coupling said electrical response from said device.

3,922,554

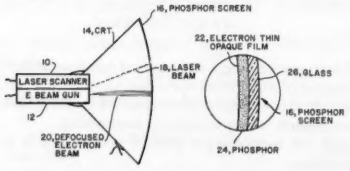
SENSITIZED VIDEO PHOSPHOR MOTION PERCEPTION DISPLAY

Paul M. Koloc, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1974, Ser. No. 473,457

Int. Cl.[2] H01J *31/50*

U.S. Cl. 250—461 **5 Claims**



2. A device for displaying both a stationary and moving object in a scene under a first mode of operation and only moving objects in said scene under a second mode of operation comprising:
a phosphorous layer deposited on a glass plate to form a phosphorous screen;
means for producing a focussed electron beam in said first mode of operation and a defocussed electron beam in said second mode of operation which is scanned across said phosphorous screen; and,
means for producing a photo effect source which is modulated with image information and scanned synchronously with said means for producing a defocussed electron beam, said means for producing a photo effect source being activated only during said second mode of operation for producing a photo effect raster representative of said scene on said phosphorous screen such that the photo effect state of said phosphorous screen is continually changing for moving objects in said scene causing said screen to emit an image of only said moving objects.

3,922,555

PORTABLE INSTRUMENT FOR SELECTIVELY DETECTING ALPHA-PARTICLES DERIVED FROM RADON

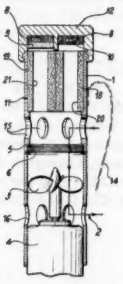
Anne Marie Chapuis, and Danielle DaJlevic, both of Fontenay aux Roses, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 10, 1973, Ser. No. 377,927

Claims priority, application France, July 13, 1972, 72.25550

Int. Cl. G01t *1/02*

U.S. Cl. 250—472 **3 Claims**



1. A portable instrument for selectively detecting the alpha-particles emitted simultaneously by radium A and radium C′ which are derived from radon and more particularly for monitoring the atmosphere in mines, wherein said instrument comprises in combination:
a device for sampling air through a filter which retains the α-emitting aerosols,
a detector in which the α-particles corresponding to the respective energies of the α-emissions of radium A and of radium C′ are detected separately,
two collimators placed between the filter and the detector whereby said collimators direct the alpha radiation from the aerosols collected by said filter to said detector.

3,922,556

SILVER HALIDE PHOTOGRAPHIC EMULSIONS USED FOR ELECTRON BEAM RECORDING

Junichi Matsuyama; Yoshiyuki Nakazawa; Yasuharu Nakamura; Reiichi Ohi, all of Kanagawa, Japan, and Tokiharu Kondo, deceased, late of Kanagawa, Japan (by Yoshiharu Kondo, legal representative)

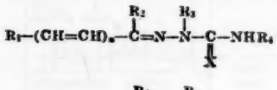
Continuation-in-part of Ser. No. 214,460, Dec. 30, 1971, abandoned. This application Jan. 15, 1974, Ser. No. 433,609

Claims priority, application Japan, Dec. 30, 1970, 45-123037

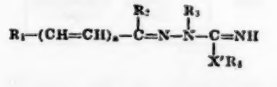
Int. Cl. G01n *23/04*

U.S. Cl. 250—475 **10 Claims**

6. A process for recording electron beams which comprises imagewise exposing to electron beams a silver halide photographic emulsion containing at least one compound represented by Formula (I) or Formula (II) below, or the salts thereof:



(I)



(II)

wherein X represents a member selected from the group consisting of an oxygen atom, a sulfur atom and a =N—H group; wherein X′ represents a sulfur atom; wherein R_1 and R_2 each represents a member selected from the group consisting of a hydrogen atom, an alkyl group, an aryl group, and a heterocyclic group selected from the group consisting of a pyridine group, an imidazole group, a benzimidazole group, a benzothiazole group and a naphthothiazole group; wherein R_3 represents a member selected from the group consisting of a hydrogen atom and a lower alkyl group; wherein R_4 represents a member selected from the group consisting of a hydrogen atom, an alkyl group, an aryl group and a vinylmethyl group; and wherein *n* represents an integer of 0 to 1,

the silver halide in said silver halide photographic emulsion having a mean grain size, by diameter of no greater than 0.2 microns.

3,922,557

APPARATUS FOR THE OPTICAL EXAMINATION OF ARTICLES

W. Robert Carnes, Jr., Darien, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 2, 1974, Ser. No. 457,388

Int. Cl.² H01J *39/12*

U.S. Cl. 250—578 **5 Claims**

1. An optical examination apparatus for examining bills of currency: comprising

a housing including first and second block members which are closely spaced so as to define a narrow slot-like passage through which planar articles may be conveyed;

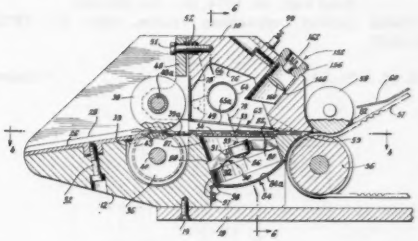
each of said block members having a cavity formed therein, said cavities being generally mutually aligned;

a light source positioned in the cavity of said first block member and arranged for projecting a light beam across said passage and into the cavity of said second block member;

a light gathering and reflective means having an optical focal point and positioned in the cavity of said second block, said light gathering and reflective means being arranged for gathering light which is projected into said second cavity and for optically integrating and reflecting said light towards said focal point;

a photodetector;

means mounting said photodetector in said cavity of said second block at said focal point; and



means for transporting a planar article through said passage and between said light source and the light gathering and reflective means whereby the intensity of the light beam projected from the first to the second cavity is diminished in accordance with the light transmissivity of said article and whereby an output signal may be produced by said photodetector which is representative of the light transmissity of said article.

3,922,558

STARTER MOTORS

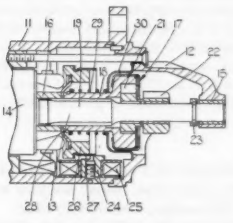
John David Hollyoak, Birmingham, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 3, 1974, Ser. No. 511,501

Claims priority, application United Kingdom, Oct. 5, 1973, 46567/73

Int. Cl.² H02K *1/06*

U.S. Cl. 290—38 A **8 Claims**



1. A starter motor for an internal combustion engine including an electric motor, a shaft rotated in use by said electric motor, a pinion assembly rotatable with said shaft and moveable axially relative thereto between a rest position and an operative position, means for moving the pinion assembly from its rest position to its operative position, said means including a member which bears against one end of the pinion assembly and which in the rest position of the pinion assembly is trapped between the pinion assembly and a part carried by said shaft, and said means further including an electromagnet having an associated armature coupled to said member, the electromagnet when energised moving said armature so as to urge the pinion assembly, by way of said member, towards its operative position, the arrangement being such that when the electric motor is energised said shaft and said pinion assembly rotate relative to the armature and said member, and said armature and said member act as a brake to rotation of the

pinion assembly and said shaft upon return of the pinion assembly to its rest position.

3,922,559

DOUBLED PARALLEL ELECTRIC POWER SOURCES

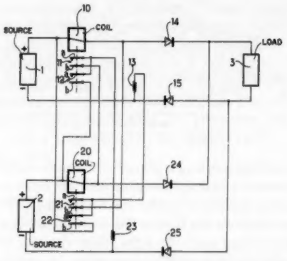
Rene Migeon, Boulogne Billancourt, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Sept. 24, 1974, Ser. No. 508,943

Claims priority, application France, Sept. 27, 1973, 73.34631

Int. Cl.² H02J *9/00*

U.S. Cl. 307—64 **3 Claims**



1. A safety device for the continuous transmission of electrical power to a load comprising: first and second electrical power sources, means connecting said sources in parallel to the load, first and second auxiliary loads connected in series with said first and second power sources, respectively; switching means disposed between said power sources and said auxiliary loads for selectively coupling said sources to said load or said respective auxiliary loads; said switching means comprising first and second relays and coils, said first relay having at least two contacts, said first coil connected in series between said first source and the load, the first contacts of said first relay connected in series with said second source and said second auxiliary load, the second contacts of said first relay connected in parallel with said second coil; said second relay having at least two contacts, said second coil connected in series between said second source and the load, the first contacts of said second relay connected in series with said first source and said first auxiliary load and the second contacts of said second relay connected in parallel with said first coil.

3,922,560

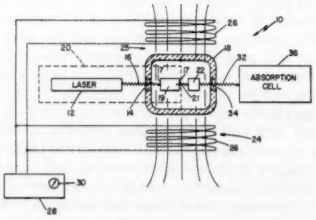
TWO FREQUENCY STIMULATED SPIN FLIP

Peter A. Wolff, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 26, 1973, Ser. No. 326,923

Int. Cl.² H02M *5/06*

U.S. Cl. 307—88.3 **23 Claims**



21. A far infrared coherent radiation source comprising a sample of a semiconductive material transmissive in both a first frequency range above about 30,000 GHz and in a second frequency range between about 300 GHz and 30,000 GHz, means for applying a magnetic field to said sample to provide a spin-flip frequency in said second frequency range and means for pumping said sample with at least a first coherent beam of radiation in said first frequency range, said sample and said pumping means being mutually oriented for generation of at least a coherent radiation at the spin-flip frequency in a three-frequency interaction.

3,922,561

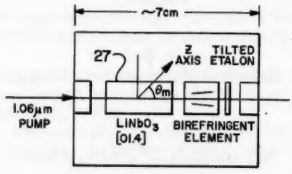
TUNABLE ELECTROMAGNETIC OSCILLATOR USING [01.4] GROWN $LINBO_3$ AND METHOD

Robert L. Byer, 891 Allardice Way, Stanford, Calif. 94305, and Richard L. Herbst, 911 Fremont Place, Menlo Park, Calif. 94025

Filed Oct. 3, 1974, Ser. No. 511,604

Int. Cl.² H02M *5/04*

U.S. Cl. 307—88.3 **7 Claims**



1. In an electromagnetic oscillator, means for providing a pump electromagnetic radiation beam having an output at a predetermined frequency, a crystal of $LiNbO_3$ grown in the direction perpendicular to [01.4] and poled to [01.4], means for supporting and orienting said crystal at a phasematching angle to said pump beam and in a path thereof.

3,922,562

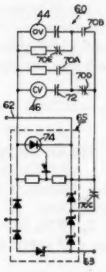
GAS OPERATOR FOR AN ELECTRIC SWITCH DEVICE

Norman W. Stunkard, Lake Oswego, Oreg., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 4, 1974, Ser. No. 529,348

Int. Cl.² H02B *1/24*

U.S. Cl. 307—112 **5 Claims**



1. A switch operator apparatus for operating a switch device in opening and closing movements;

a support bracket adapted to be mounted on other structure;

a reversible fluid motor;

mechanical means carried by said bracket connecting said fluid motor to the switch device;

a source of pressure fluid removably carried on said bracket;

a first solenoid operated valve connected to said source of pressure fluid and to one side of said fluid motor, said first

valve being operable when energized to direct the pressure fluid from said source to said fluid motor to effect its operation in one direction to effect a closing operation of the switch device;

a second solenoid operated valve connected to said source of pressure fluid and to the second side of said fluid motor, said second valve being operable when energized to direct the pressure fluid from said source to said fluid motor to effect its operation in a second direction for effecting an opening operation of the switch device;

an electrical circuit means connected to selectively energize the solenoids of said first and second valve; and,

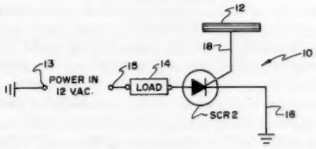
means connected to said electrical circuit means, said directive signals from a source and to decode the directive signal received for transmission to said electrical circuit means for the energization of a selected one of said first and second valves according to the directive signal received.

3,922,563

SOLID STATE TOUCH OPERATED SWITCH

Richard E. Penman, 4189 S. 300 West Apt. 70, Ogden, Utah 84403

Filed Aug. 28, 1974, Ser. No. 501,378
Int. Cl.² H01H *36/00*
U.S. Cl. 307—116 **6 Claims**



1. A touch plate solid state switch comprising:

power input means for receiving low voltage electrical power and communicating said power to the input of a load;

a silicon controlled rectifier;

means solely and directly electrically connecting the output of the load to the anode of the silicon controlled rectifier; touch plate means;

means solely and directly connecting the gate of the silicon controlled rectifier to the touch plate means;

means electrically connecting the cathode of the silicon controlled rectifier to ground.

3,922,564

LIQUID LEVEL CONTROL

Paul T. Kachuk, 820 Kensington Blvd., Fort Wayne, Ind. 46805, and Ronald E. Karst, R.R. No. 2, Kendalville, Ind. 46755

Filed Jan. 31, 1974, Ser. No. 438,251
Int. Cl.² G01F *23/00*
U.S. Cl. 307—118 **15 Claims**

1. A liquid level control device comprising

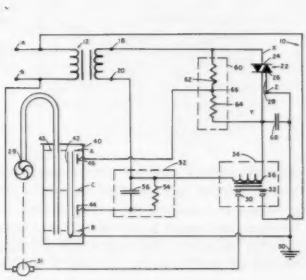
a. upper and lower sensors positioned in vertically spaced relation in a fluid reservoir and individually operable between conductive and non-conductive states in response to the level of fluid in said reservoir,

b. a motor control device operative between "on" and "off" states in response to a current of predetermined magnitude,

c. a source of electric operating potential,

d. a switching element having electrode means for coupling the switching element electrically between said motor control device and said source and further having a control electrode, said switching element being operable between conductive and non-conductive states in response to the presence and absence, respectively, of a control signal between said electrode means and said control electrode,

e. first biasing circuit means consisting of passive circuit elements coupled to said electrode means and coupled to said control electrode through said lower sensor for applying a first control signal between said electrode means and said control electrode when said lower sensor changes between conductive and non-conductive states,



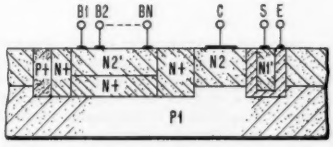
f. second biasing circuit means consisting of passive circuit elements coupled to said electrode means and coupled to said control electrode through the upper sensor for applying a second control signal between said control electrode and electrode means when said upper sensor changes between conductive and non-conductive states to turn said switching element "on", said switching element remaining "on" until said lower sensor changes back to its original state.

3,922,565

MONOLITHICALLY INTEGRABLE DIGITAL BASIC CIRCUIT

Horst H. Berger, Sindelfingen, and Siegfried K. Wiedmann, Stuttgart, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,581
Claims priority, application Germany, Dec. 20, 1972, 2262297
Int. Cl.² H01L *27/04;* **H03K** *19/12, 19/34*
U.S. Cl. 307—213 **12 Claims**



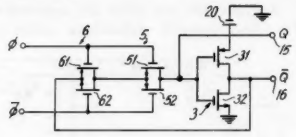
1. Monolithically integrable, digital basic circuit comprising:

a switching transistor coupled with a suitable power supply, the base region of said transistor having diodes connected thereto, characterized in that the collector of the switching transistor and the diodes are formed as Schottky contacts on the semiconductor zone forming the base region of the switching transistor, wherein the Schottky barriers for the Schottky contact forming the collector and for the Schottky contacts forming the diodes are chosen to be different.

3,922,566
DYNAMIC BINARY COUNTER CIRCUIT

Yukuo Kodama, and Tsuyoshi Ando, both of Tokyo, Japan, assignors to Nippon Electric Co., Inc., Tokyo, Japan

Filed July 16, 1974, Ser. No. 488,997
Claims priority, application Japan, July 24, 1973, 48-83749
Int. Cl.² H03K *23/8*
U.S. Cl. 307—220 C **7 Claims**

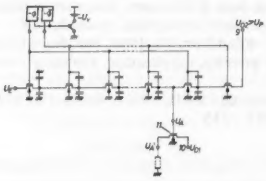


1. A dynamic binary counter circuit comprising inverter means having an input terminal and an output terminal, first switching means and second switching means connected in cascade between said input terminal and said output terminal of said inverter means, a first capacitor connected to said input terminal of said inverter means, a second capacitor connected between said first switching means and said second switching means, the capacitance of said second capacitor being greater than the capacitance of said first capacitor, and control means for alternately turning said first and second switching means on and off.

3,922,567
INTEGRATED IGFET BUCKET-BRIGADE CIRCUIT

Fritz G. Adam; Cornelius Obermeier, both of Freiburg; Gerhard Scheffer, and Klaus Wilmsmeyer, both of Denzlingen, all of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,615
Claims priority, application Germany, May 17, 1973, 2324914
Int. Cl.² G11C *19/00*; H01L *29/78*
U.S. Cl. 307—221 C **6 Claims**



1. An integrated bucket-brigade circuit wherein there is provided a plurality of stages each containing a transistor and a capacitor coupled between the gate and drain electrode thereof, and coupled together such that the drain electrode of each transistor is connected to the source electrode of the next successive transistor, and wherein a first clock signal is coupled to the gate terminals of even-numbered transistors and the complement of said first square wave clock signal controls the gate terminals of the odd-numbered transistors, comprising:

a source of operating voltage;

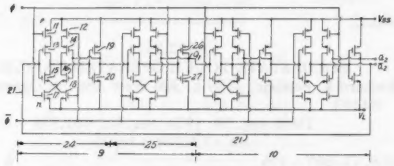
first and second sources of clock pulses, said first source coupled to said even-numbered transistors and said second source coupled to said odd-numbered transistors; and

a row of field-effect transistors of the depletion-layer type having source and drain regions, said field-effect transistors employing gate electrodes on an insulated-gate layer, wherein the last transistor in said row is provided with an electrical terminal to which said source of operating voltage is coupled, said operating voltage having polarity opposite to the polarity of said clock pulses and having magnitude greater than the pinch-off voltage of said last transistor.

3,922,568
DRIVING CIRCUITS FOR ELECTRONIC WATCHES

Tetsuro Hama, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Division of Ser. No. 414,572, Nov. 9, 1973, which is a continuation of Ser. No. 239,477, March 30, 1972, abandoned. This application July 22, 1974, Ser. No. 490,591
Claims priority, application Japan, Mar. 31, 1971, 46-19075
Int. Cl.² H03K *23/22*, *27/00*
U.S. Cl. 307—223 C **3 Claims**



1. A section of a delay flip-flop circuit comprising first and second positive logic AND-NOT circuits each formed from the series-connection of the source-drain paths of first and second N-channel insulated gate field effect transistors; first and second negative logic AND-NOT circuits each formed from the series-connection of the source-drain paths of first and second P-channel insulated gate field effect transistors; a complementary NOT circuit formed from an N-channel and a P-channel insulated gate field effect transistor; and electric source means having a pair of terminals said first and second positive logic AND-NOT circuits being connected in parallel to define a positive logic AND-NOT-AND circuit, said first and second negative logic AND-NOT circuits being connected in parallel to define a negative logic AND-NOT-AND circuit, said positive and negative logic AND-NOT-AND circuits being connected in series with each other between said pair of terminals of said electrical source means, the series connection of said positive and negative logic AND-NOT-AND circuits defining a connecting point terminal connected to an input of said complementary NOT circuit, an output of said complementary NOT circuit defining an output of said section of said flip-flop circuit and being connected to a gate of said first transistor of each of said first positive and first negative logic AND-NOT circuits, said section of said flip-flop circuit including a write input connected to a gate of said first transistor of each of said second positive and second negative logic AND-NOT circuits; a first control signal input means connected to the gate of the second transistor of each of said first positive and second negative logic AND-NOT circuits, and a second control signal input means connected to the gate of the second transistor of each of said second positive and first negative logic AND-NOT circuits, said second control signal being the inverse of said first control signal.

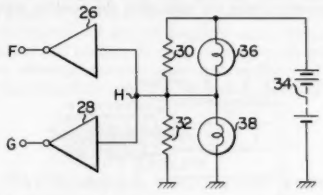
3,922,569
POTENTIAL DETECTOR

Hiroshi Nabetani; Atsushi Ueda; Kosaku Uota, and Mitsuaki Ishii, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1974, Ser. No. 435,578
Claims priority, application Japan, Jan. 27, 1973, 48-11278
Int. Cl.² H03K *5/20*; H01J *7/42*; H05B *37/03*
U.S. Cl. 307—235 R **1 Claim**

1. A detector device for detecting electric potentials wherein said device includes a plurality of pairs of complementary MOS field effect transistors having respective input

terminals connected together, an analog detected member comprised of a pair of electric lamps serially connected across source of direct current and one resistor connected across each of said electric lamps, said resistors having therebetween a ratio of a value of resistance substantially equal to that between said electrical lamps and being higher in the value of resistance than said electrical lamps, and wherein a point at



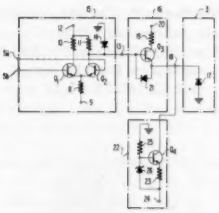
which said electrical lamps are serially interconnected is connected to a common input terminal while in the normal operation of said electrical lamps, said common input terminal has a potential higher than a threshold voltage of one of said pairs of complementary MOS field effect transistors and lower than a threshold voltage of the other complementary MOS field effect transistors.

3,922,570

DRIVER CIRCUIT FOR MODULATING DIODE

Iwao Eguchi; Tadao Shimamura, and Yukio Takimoto, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Dec. 20, 1973, Ser. No. 426,756
Claims priority, application Japan, Dec. 23, 1972, 47-1015
Int. Cl.² H03K *17/00*
U.S. Cl. 307—270 **1 Claim**



1. A driver circuit for a modulating diode which comprises, a constant-current circuit for supplying a constant forward current to said modulating diode, and a low-impedance output circuit for applying a reverse bias voltage to said modulating diode, said low-impedance output circuit being in the "off" state when said modulating diode is forward biased, and in which said constant-current circuit and said low-impedance output circuit are both connected to one of the terminals of said modulating diode,

said low-impedance output circuit comprising a transistor connected in an emitter follower circuit arrangement and having its emitter connected to said one terminal of said modulating diode, and a diode connected in an opposite polarity sense across the base-emitter junction of said transistor, and

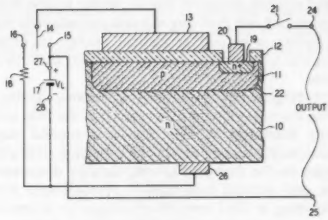
said driver circuit further comprising, a differential amplifier circuit having two input terminals adapted to receive complementary modulating pulses and an output terminal, means for clamping negative voltages at said output terminal to a voltage close to zero volts, said output terminal being connected to the input of said emitter follower circuit.

3,922,571

SEMICONDUCTOR VOLTAGE TRANSFORMER

George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 12, 1974, Ser. No. 478,606
Int. Cl.² H01L *29/94*; H02M *7/10*
U.S. Cl. 307—296 **9 Claims**



1. A device for increasing electrical potential comprising:

a first zone of semiconductor material of one conductivity type;

a second zone of semiconductor material of opposite conductivity type overlying at least a portion of said first zone so as to form a p-n junction therebetween;

an insulating layer covering at least a portion of the major surface defined by said first and second zones;

a metal electrode disposed on said insulating layer overlying a portion of the area over said second zone;

conduction means for applying a forward bias to said metal electrode with respect to said p-n junction; and

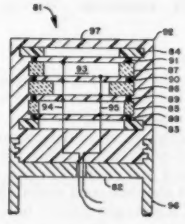
an output circuit including contact means formed at the major surface within said second zone for removing minority carriers collected at the surface of said second zone resulting from said forward-biased condition and circuit means for adding the potential of said collected minority carriers and said applied potential, said contact means making rectifying contact to said second zone.

3,922,572

ELECTROACOUSTICAL TRANSDUCER

Rufus L. Cook, Panama City, and James H. Elkins, Lynn Haven, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 12, 1974, Ser. No. 496,498
Int. Cl.² H01L *41/04*
U.S. Cl. 310—9.1 **22 Claims**



1. An electroacoustical transducer, comprising in combination:

a substantially rigid backing plate means, having at least one hole therethrough;

first washer means, having a predetermined inside diameter and a predetermined outside diameter, spatially disposed from said substantially rigid backing plate means;

a first ring-shaped piezoelectric means, having a first inside diameter and a first outside diameter, spatially disposed from said first washer means, for producing a first acoustical energy in proportional response to electrical energy supplied thereto and vice versa;

a second ring-shaped piezoelectric means, having a second inside diameter that is different from the first inside diameter of said first ring-shaped piezoelectric means and a scond outside diameter that is similar to the first outside diameter of said first ring-shaped piezoelectric means, for producing a second acoustical energy in proportional response to electrical energy supplied thereto and vice versa;

a third ring-shaped piezoelectric means, having a third inside diameter that is different from the first and second inside diameters of said first and second ring-shaped piezoelectric means and a third outside diameter that is similar to the first and second outside diameters of said first and second ring-shaped piezoelectric means, for producing a third acoustical energy in proportional response to electrical energy supplied thereto and vice versa;

a second washer means having a predetermined inside diameter and a predetermined outside diameter, spatially disposed from said third ring-shaped piezoelectric means; electrical conductor means connected to said first, second, and third ring-shaped piezoelectric means and effectively passing through said at least one hole in said substantially rigid backing plate means for effecting the electrical connection thereof in a predetermined electrical circuit arrangement;

a plurality of polyurethane spacer means having inside diameters greater than the largest of the inside diameters of said first, second, and third ring-shaped piezoelectric means and outside diameters smaller than the outside diameters thereof respectively disposed between adjacent ones of said first, second and third ring-shaped piezoelectric means and the aforesaid first and second washer means; and

acoustically clear means connected to each of the aforesaid means for effecting the holding thereof in the aforesaid spatial dispositions, respectively, for the containment thereof as an encapsulated unit of predetermined external geometrical configuration.

3,922,573

APPARATUS FOR SUPPLYING COOLING CHANNELS OF ROTORS OF ELECTRICAL MACHINES WITH COOLING WATERS

Manfred Pluschke, Velbert, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

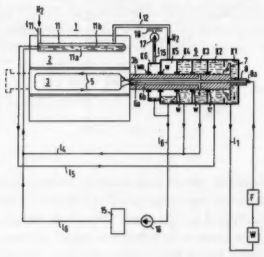
Filed Aug. 29, 1974, Ser. No. 501,653

Claims priority, application Germany, Aug. 31, 1973, 2344069

Int. Cl. H02k 9/00

U.S. Cl. 310—53 **3 Claims**

1. In apparatus for supplying cooling water to the cooling channels of an electrical machine rotor having a rotor shaft, an inlet chamber surrounding the rotor shaft in liquid-tight relation to the ambient, an outlet chamber communicating with the rotor channels for receiving the cooling water, the latter being heated and reduced in pressure by its passage through the rotor channels, said outlet chamber surrounding the rotor shaft in liquid-tight relation to the ambient, primary conveying means connected between said outlet chamber and said inlet chamber for conducting the water between said outlet chamber and said inlet chamber; pump means for supplying the cooling water to said inlet chamber under pressure and for urging the same through said primary conveying means; a leakage water chamber next to said outlet chamber in a direction toward the ambient, said leakage water chamber having a first contactless seal disposed with respect to the shaft where said leakage chamber adjoins the ambient and a second contactless seal where said leakage chamber adjoins said outlet chamber, said leakage chamber serving to collect cooling water which leaks through said second seal during normal operation, said cooling water being mixed with air leaking into said leakage-water chamber from the ambient, said pump means communicating with said leakage-water chamber for drawing the leakage cooling water from said leakage chamber, hydrogen gas supply means connected to said conveying means for saturating the cooling water con-



veyed by the latter with hydrogen, and an oxygen removal device for receiving the leakage water mixed with air, said device being connected between said leakage water chamber and said primary conveying means; the improvement therein comprising means connecting the hydrogen gas supply means to the leakage water chamber, and a gas suction chamber next to the leakage water chamber in direction toward the ambient, said gas suction chamber being connected through a blower to a waste gas line.

3,922,574

PERMANENT MAGNET HERMETIC SYNCHRONOUS MOTOR

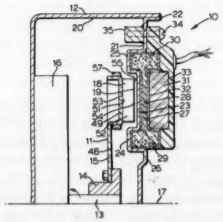
Eric Whiteley, Peterborough, Canada, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,159

Claims priority, application Canada, Apr. 4, 1974, 196824

Int. Cl.³ H02K 21/12

U.S. Cl. 310—156 **8 Claims**



1. An axial gap synchronous motor comprising a hermetic enclosure having a relatively thin annular wall portion of substantially uniform thickness; a disc-shaped permanent magnet rotor supported inside said enclosure for rotation on an axis coinciding with the axis of said annular wall portion, said rotor having first magnetic means linked magnetically with a plurality of permanent magnet pole bodies spaced apart in an annular array coaxial with respect to said axis of rotation, and said pole bodies being oriented magnetically in an axial direction and having alternate north and south polarity pole faces lying in an annular surface located near and conforming with the inner surface of said annular wall portion but spaced axially therefrom; an annular array of overlapping coils bonded together by means of a bonding medium to form a

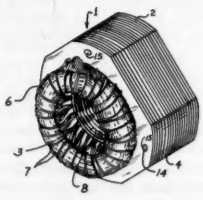
unitary discoidal winding structure having an annular disc portion containing the coil sides and inner and outer ring portions containing the coil end-heads, each one of said coils having its sides generally radial and at a coil span of approximately one pole pitch, and said coils being interconnected as an alternating current winding; means for supporting said winding structure outside said enclosure coaxial with respect to said axis of rotation and with one side of the winding disc portion adjacent the outer surface of said annular wall portion of the enclosure; and second magnetic means located on the other side of said winding disc portion and linked magnetically with the winding structure, said first and second magnetic means providing flux paths for the pole bodies and the winding.

3,922,575

STATOR ASSEMBLY WITH BORE SLEEVE

Francis J. Sauer, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 30, 1972, Ser. No. 239,570
Int. Cl.² H02K *3/48*
U.S. Cl. 310—214 **4 Claims**



1. A stator assembly for a dynamoelectric machine, comprising:

a core of stacked laminations, individual ones of said laminations being constructed from magnetic material having teeth with surfaces aligned to define a bore and axially extending slots opening into said bore, said teeth having root and stem sections, said stem sections having sides which are straight from the root section to the bore;

a winding including a plurality of wire turns placed in said slots in a predetermined manner; and

an inner bore sleeve mounted in an secured against displacement along the bore defining surfaces of said teeth, said bore sleeve comprising a tightly wound continuous helical coil wound from a wire constructed from the same magnetic material as said laminations, said wire having a width dimension and a thickness dimension, said width dimension being substantially flat, said bore sleeve abutting the bore defining surfaces of said teeth along said flat width dimension, said coil defining a substantially cylindrical shape having a longitudinal length approximately equal to the longitudinal length of said core of stacked laminations, individual turns of said coil being bonded to one another by an epoxy adhesive at least along the thickness dimension of said wire.

3,922,576

IMAGE INTEGRATION AND TRANSFER PLATE

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

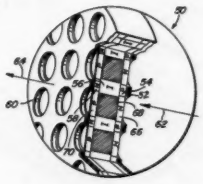
Filed July 25, 1974, Ser. No. 491,909
Int. Cl.² H01J *39/04*, *43/08*
U.S. Cl. 313—95 **6 Claims**

1. A semiconductor assembly for receiving an incident electron image, then integrating and transferring therefrom, an intensified electron image, the assembly comprising:

first and second spaced conducting grids having apertures therein;

P and N semiconductor caps positioned in spaced relationship to each other, in alignment with each other and the apertures of said conducting grids, the N caps being located in a first plane and the P caps in a second plane, the P and N semiconductor caps further being positioned between the conducting grids;

a P type semiconductive grid in said first plane in contact with said first conducting grid, and an N type semiconductive grid in contact with said second conducting grid,



said conducting grids having aligned apertures, elements of said P type semiconductive grid forming PN junctions with said N caps, and elements of said N type semiconductive grid forming PN junctions with said P caps;

conductor means located inwardly of the conducting grids and individually connecting each pair of P and N semiconductor caps;

reverse biasing said PN junctions causing storing of electrons therein during a first time interval; and

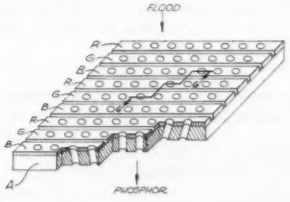
means connected to the conductor grids for biasing the grids and causing emission of stored electrons into space during a second time interval.

3,922,577

CHANNEL PLATE ELECTRON MULTIPLIER ADJACENT COLOR DOT SCREEN

Richard Kaspar Orthuber, Sepulveda, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 198,835, Nov. 15, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,478
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H01J *43/24*, *37/22*
U.S. Cl. 313—105 **6 Claims**



1. A device for registering color phosphor dots in a television tube comprising, a phosphor screen coated with color dots, a dielectric channel plate electron multiplier positioned adjacent said phosphor screen, said channel plate including a plurality of parallel columns of holes therethrough between opposite sides of said plate, said holes having resistive secondary emissive surfaces therein, electrodes on said opposite sides having corresponding holes coinciding with said dielectric plate holes, one of said electrodes on one side including a plurality of spaced parallel electrodes along respective columns of holes, the holes in each respective column having a common axial angle through said plate with respect to the plane of said screen different from the angle of the holes in each adjacent column, each column of holes with respective

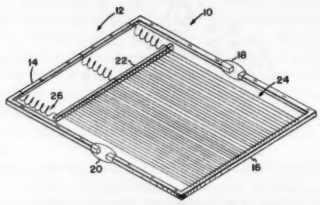
different common angles being repetitive in every third column across said plate, and each column of holes being aligned with a corresponding column of phosphor dots on said screen.

3,922,578

LARGE AREA CATHODE

Robert F. Wilson, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 1, 1974, Ser. No. 465,860
Int. Cl.² H01J 1/94; H01K 1/18
U.S. Cl. 313—278 **5 Claims**



1. A large area cathode comprising: a main peripheral frame comprised of two sections joined together by an electrically insulating material whereby each section is electrically isolated from the other; a secondary frame mounted within said main frame; a large plurality of directly heated cathode wires extending between one section of said main frame and said secondary frame and affixed thereto; and tensioning means extending between said secondary frame and the other section of said main frame.

3,922,579

PHOTOCONDUCTIVE TARGET

Naohiro Goto; Yukinao Izozaki, both of Machida; Keiichi Shidara, Tokyo; Eiichi Maruyama; Tadaaki Hirai, both of Kodaira; Kiyohisa Inao, and Ikue Mori, both of Hachioji, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of, Japan

Continuation-in-part of Ser. No. 135,218, April 19, 1971, abandoned. This application Nov. 22, 1972, Ser. No. 308,677
Claims priority, application Japan, Apr. 22, 1970, 45-33767
Int. Cl.² H01J 29/45, 31/38, 39/14
U.S. Cl. 313—366 **9 Claims**

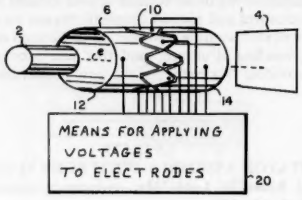
1. A photoconductive target comprising a transparent substrate having a flat surface, a transparent conductive layer formed on said substrate, an N-type semiconductor formed on said conductive layer, and a P-type photoconductive layer consisting of tellurium not exceeding 30 atomic %, arsenic ranging from 2 to 30 atomic % and the remainder of selenium provided on said N-type semiconductor layer and forming a hetero-junction therewith, said hetero-junction being reverse biased, said N-type semiconductor layer comprising a material selected from the group consisting of zinc selenide, cadmium sulfide, cadmium selenide, zinc sulfide, gallium arsenide, indium oxide, tin oxide, titanium oxide, germanium and silicon.

3,922,580

SIMULTANEOUS ELECTROSTATIC FOCUSING AND DEFLECTION SYSTEM

Rudolf G. E. Hutter, New York, N.Y., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 28, 1974, Ser. No. 473,591
Int. Cl.² H01J 29/74, 29/62
U.S. Cl. 313—427 **6 Claims**



1. An electrostatic electrode system for controlling an electron beam for use in an Einzel lens comprising:

A. eight mutually separated electrode segments arranged as cylindrical segments around the surface of an imaginary cylinder of radius R at angular intervals of $\pi/4$, opposite segments being diametrically symmetrical with respect to an axis of the imaginary cylinder,

B. a first cylindrical electrode section of a radius of substantially R having an axis coincident with the axis of the imaginary cylinder, the first section having first extensions at one end thereof at angular intervals of $\pi/4$, the first extensions being interleaved with and insulated from the eight electrode segments, and the first section extending axially away from the first extensions at the one end thereof to a smooth end of the first section at an axially opposite end thereof.

C. a second cylindrical electrode section of a radius of substantially R having an axis coincident with the axis of the imaginary cylinder, the second section having second extensions at one end thereof at angular intervals of $\pi/4$, the second extensions being interleaved with and insulated from the eight electrode segments, and the second section extending axially away from the second extensions at the one end thereof to a smooth end of the second section at an axially opposite end thereof, and

D. means for applying voltages for electrostatic control to the segments and sections of the electrode, said means including

1. means for applying a first voltage to each of the electrode segments, and
2. means for applying a second voltage to both of the electrode sections.

3,922,581

DETECTORS INCLUDING SCINTILLATING MEANS FOR BEAM INDEX CATHODE RAY TUBES

David M. Goodman, 14272 Half Moon Bay Drive, Del Mar, Calif. 92014

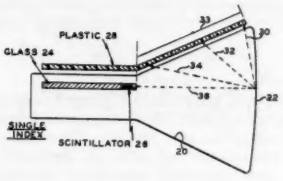
Continuation of Ser. No. 119,504, March 1, 1973, abandoned, Division of Ser. No. 562,031, June 2, 1966, Pat. No. 3,567,985, which is a continuation of Ser. No. 212,612, July 26, 1962. This application Aug. 8, 1973, Ser. No. 386,511
Int. Cl. H01J 31/20, 29/08
U.S. Cl. 313—471 **16 Claims**

1. In a beam-index color television display apparatus comprising in combination:

1. a cathode ray tube with an envelope containing an image-producing target screen and an electron gun for providing a scannable electron beam;
2. said target screen comprising a repeating array of different color producing strips in register with beam-index strips for generating electromagnetic index radiation

indicative of the position of impact of the electron beam on the target screen;

3. means for scanning said electron beam across target screen; thereby to impact said color producing strips and said beam-index strips;
4. detection means responsive to the index radiation thus emitted from said beam-index strips; and
5. means responsive to the output of said detection means for modulating the electron beam thereby to properly excite said color producing strips;



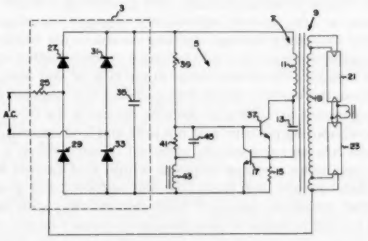
the improvement in said detection means comprising an elongated strip-like scintillator having the properties of a light pipe and being disposed so as to be excited along its length via the index radiation from many of the beam-index strips whereby optical signals generated in its interior region are transmitted via a series of internal reflections to emerge at an exit terminal thereof where the optical signals are used to control the modulation of the electron beam.

3,922,582

CURRENT LIMITED OXCILLATOR ARRANGEMENT

Ira Jay Pitel, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 22, 1974, Ser. No. 499,447
Int. Cl.² H05B *41/24*
U.S. Cl. 315—106 **12 Claims**



1. Current limiting oscillator circuitry comprising:

a DC potential source;

load circuit means including a transformer having an inductive reactance means connected to said DC potential source and a secondary winding coupled to a low pressure electric discharge lamp;

oscillator means coupled to said DC potential source and to said inductive reactance means of said load circuit means; sampling means coupling said oscillator means connected to said inductive reactance means to a potential reference level; and

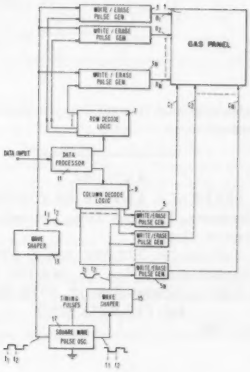
switching means coupled to said sampling means and to said oscillator means and intermediate said oscillator means and said potential reference level whereby current flow exceeding a given level through said oscillator means and inductive reactance of said load circuit means as determined by said current sampling means activates said switching means which limits current flow in said oscillator means to effect development of a potential at said load circuit means in an amount greater than said DC potential source for application to said low pressure electric discharge lamp.

3,922,583

METHOD AND MEANS FOR INCREASING THE OPERATING RANGE OF GAS PANEL DISPLAYS

Conrad Lanza, Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1974, Ser. No. 483,759
Int. Cl.² H05B *37/00*
U.S. Cl. 315—169 TV **4 Claims**



1. A method of operating the sustain function of a gas discharge display and memory panel to increase the operating margin thereof, said panel having substantially orthogonal sets of insulated X and Y conductors arranged so that the respective crossover points thereof form an array of memory cells selectively addressable by application of read and write pulses to appropriate X and Y conductors, the improvement comprising the steps of;

applying alternating polarity sustain pulses between said sets of X and Y conductors at a frequency between 40 and 80 K Hz; and

causing the said alternating polarity sustain pulses applied between said sets of X and Y conductors to be applied between said sets of X and Y conductors with a risetime between 1.8 and 2.2 μ Sec.

3,922,584

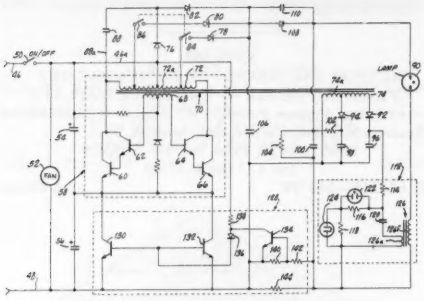
ARC LAMP IGNITION AND OPERATING CIRCUIT

Robert J. Strowe, Lake Hopatcong, N.J., assignor to Streamlight, Inc., King of Prussia, Pa.

Filed Nov. 2, 1973, Ser. No. 412,123
Int. Cl.² H05B *41/00*
U.S. Cl. 315—171 **6 Claims**

1. In a circuit for energizing a Xenon arc lamp including means for applying a pulse of high voltage to the lamp to ionize it and render it conductive, the improvement for discharging current into the lamp to heat the electrodes thereof comprising first capacitor means coupled to the lamp and charged to a first voltage less than that of said high voltage for discharging current into said lamp to provide for first stage heating of said electrodes, second capacitor means, charging means for charging said second capacitor means to a second voltage less than said first voltage but substantially higher than the normal operating potential of said lamp for discharging current into said lamp sufficient to provide for second stage heating of said electrodes, and means for coupling said second capacitor means to said lamp for discharging current into said

lamp only after substantial discharge of current from said first capacitor means to provide for said second stage heating of



said electrodes resulting in enabling the arc lamp to sustain electron conduction.

3,922,585

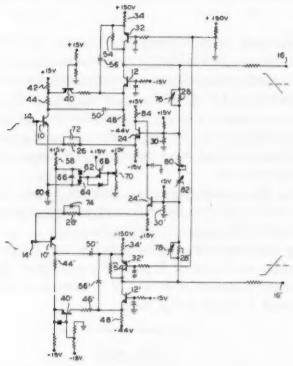
FEEDBACK AMPLIFIER CIRCUIT

Roland E. Andrews, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 375,890, July 7, 1973, abandoned, which is a continuation of Ser. No. 844,370, July 24, 1969, abandoned. This application Jan. 17, 1974, Ser. No. 433,993

Int. Cl.² H01J *29/72*

U.S. Cl. 315—389 **13 Claims**



1. A feedback amplifier circuit including at least a first amplifying means having an input and an output and exhibiting an open loop gain at said output as compared with said input, said first amplifying means comprising a first common emitter transistor stage driving a second common base transistor stage with the latter providing said output of said first amplifying means and of said amplifier circuit,

and negative feedback means coupling said output to said input of said first amplifying means over a range of frequencies at which said first amplifying means operates, said feedback means including a second amplifying means having an input and an output, wherein the input of the second amplifying means is coupled to receive the output of the first amplifying means and impedance means coupling the output of said second amplifying means to the input of the first amplifying means,

said second amplifying means comprising an emitterfollower transistor stage coupled from the output of said first amplifying means to said impedance means.

3,922,586

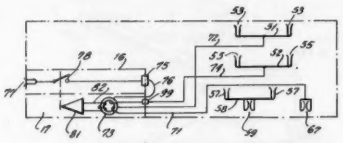
GROUND FAULT DETECTING POWER OUTLET

Aldon L. Buxton, Stone Mountain; Leonard Donnerstag, Atlanta, both of Ga., and Carl E. Gryctko, Haddon Heights, N.J., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 1, 1974, Ser. No. 456,759

Int. Cl.² H02B *1/10*

U.S. Cl. 317—112 **6 Claims**



1. A power outlet device removably mountable in an electric power distribution panel, said device including a ground fault detector-interrupter first means, a receptacle means, and an elongated unitary generally block-like insulating housing means including a first housing portion for said first means and a second housing portion for said receptacle means; said second housing portion including a front section, a rear section and retaining means securing said sections together and securing said first and second housing portions together; said first means including a line terminal at one end of said first housing portion operatively engaging a distribution panel hot conductor positioned at the rear of said first housing portion; said receptacle means including hot load contact means, grounding contact means, line neutral contact means and load neutral contact means; first conductor means within said housing means extending through said first means and connecting said hot load contact means to said line terminal; said hot load contact means being operatively engaged by plug prong means extending through opening means in the front of said second housing poriton; said grounding contact means having a first portion operatively engaged by plug prong means extending through opening means in the front of said second housing portion and having a second portion engaged with a panel ground conductor at the rear of said device; said load neutral contact means being operatively engaged by plug prong means extending to opening means in the front of said second housing portion; said hot load and load neutral contact means having substantially identical constructions; a block-like insulating member disposed within said second housing portion between said front and rear sections; said grounding contact means extending through said member with said first and second portions of said grounding contact means projecting from said member at its front and rear, respectively; said line neutral contact means being maintained by said member at a position both insulated from said load neutral contact means and operatively engaged with a panel neutral conductor at the rear of said device; second conductive means within said housing extending through said first means and connecting said line and load neutral contact means.

3,922,587

DIGITAL FEEDBACK RELAY CONTROLLER

Gary Arthur Jones, Canoga Park, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 25, 1974, Ser. No. 518,085

Int. Cl.² H01H *47/00*

U.S. Cl. 317—123 **9 Claims**

9. A method of controlling the closure of a plurality of relays comprising the steps of: storing electrical signals representing the operating characteristics of each of said relays; selecting one of said relays to be operated; extracting the

stored electrical signals representing the operating characteristics of the selected relay; and activating the selected relay for

a desired period of time controlled by the operating characteristics signals of the selected relay.

3,922,588

DRIVE ARRANGEMENT FOR SWITCHING CLOCKS

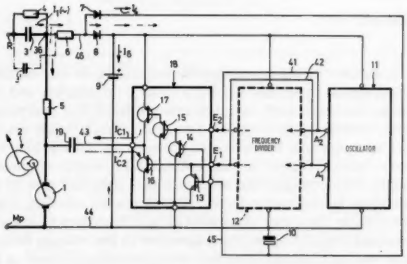
Reiner Künzel, Schonaich, Germany, assignor to Zentra Albert Burkle Kommanditgesellschaft, Schoenaich, Germany

Filed Feb. 21, 1974, Ser. No. 444,687

Claims priority, application Germany, Feb. 26, 1973, 2309598

Int. Cl.² H02J *9/00*

U.S. Cl. 318—139 **12 Claims**



1. A drive arrangement for switching clocks and the like comprising, in combination:

a. a synchronous motor having windings;

b. means for connecting said synchronous motor to an A.C. power supply means; and

c. motion reserve means including

1. a chargeable storage battery and means for charging same from said A.C. power supply means;

2. electronic circuit means, including oscillator means and supplied with power from said storage battery for producing at its output an alternating voltage to drive said synchronous motor during periods of failure of said A.C. power supply means, permanently and non-inductively coupled to the windings of said synchronous motor; and

3. control circuit means controllably coupled to said A.C. power supply means and including at least one first transistor controlled by a control voltage derived from said A.C. power supply means, and including at least one further transistor coupled to said first transistor and responsive to its output which blocks said further transistor whenever voltage from said A.C. power supply means is present; whereby said control circuit means is responsive to the A.C. power supply voltage and prevents appearance at said output of said electronic circuit means of said alternating voltage during periods said A.C. power supply means functions and allows appearance of the alternating voltage at said output of said electronic circuit means during periods said A.C. power supply fails.

3,922,589

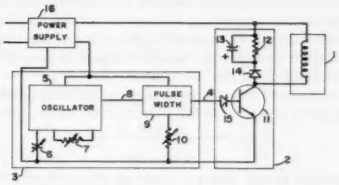
ELECTRICAL CONTROL SYSTEMS OF ELECTROMAGNETIC VIBRATORS

John F. Peckingham, Hamden, Conn., assignor to Vibra-Metrics, Inc., East Haven, Conn.

Filed June 28, 1974, Ser. No. 484,183

Int. Cl.² H02K *33/00*

U.S. Cl. 318—126 **6 Claims**



1. A controllable supply circuit for electromagnetic vibrators including: a vibratory electromagnetic motor having a coil, a source of direct current, an electronic switching device having a control electrode connected in series with said source and said coil such that a signal applied to said electrode affects the conductivity of said switching device, circuit means for providing a rectangular pulse signal to said control electrode to alternately render said switch conductive and non-conductive and establish and interrupt a circuit through said coil, a circuit including a capacitor, and a uni-directional conducting device connected in parallel with said coil, said uni-directional conducting device having its polarity opposite that of said switch, and a resistance connected in parallel with said capacitance.

3,922,590

ELECTRICAL SYSTEMS AND APPARATUS

Anthony Charles Warren, Fulbourne, and Bryan Frederick Nicholls, Northampton, both of England, assignors to The Mettoy Company Limited, Northampton, England

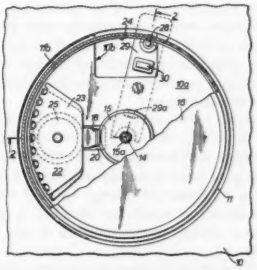
Filed Apr. 20, 1973, Ser. No. 352,950

Claims priority, application United Kingdom, Apr. 20, 1972, 18389/72; Oct. 4, 1972, 45684/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **8 Claims**



1. An electric motor comprising a rotor mounted for rotation about an axis and including a ring of material containing permanent magnetic material bonded by a plastics material to provide a number of magnetic poles of alternately opposite polarity disposed annularly about the axis of rotation of the rotor;

a stator assembly comprising a coil and two plates of magnetic material containing therebetween said coil, each

plate having one edge provided with fingers forming stator pole faces, and the fingers of the plate being interdigitated whereby, when the coil is energised, stator poles of alternately opposite polarity are produced which cooperate with the magnetic poles of the rotor to drive the motor, said edge being situated opposite a portion only of the circumference of the ring of permanent magnetic material;

rotor position sensor means disposed adjacent the ring of permanent magnetic material in a position displaced from the stator assembly in a direction peripheral of said rotor and arranged to respond to the poles of the rotor during rotation to derive an electrical signal in accordance with the rotation of the rotor; and

control means responsive to said signal for controlling energisation of said coil and the rotation of the rotor.

3,922,591

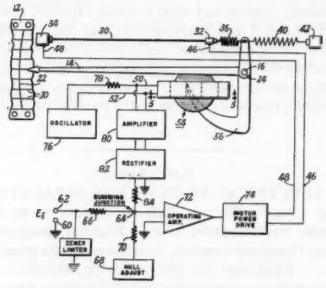
HEATED WIRE SERVO MOTOR CONTROL SYSTEM

Everett O. Olsen, Wrentham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 237,482, March 23, 1972, which is a continuation-in-part of Ser. No. 2,120, Jan. 12, 1970, abandoned. This application Dec. 4, 1973, Ser. No. 421,607

Int. Cl.² G05B *11/01, 11/00*

U.S. Cl. 318—676 **43 Claims**



1. Positioning apparatus for moving an output device to a position corresponding to an applied control signal which signal is settable to any value within a predetermined range of values, said apparatus being adapted for use with applications where relatively large movements are required, and comprising:

an element formed of an alloy exhibiting a martensitic transformation over a temperature range wherein a variation in temperature in one scale direction produces an internally generated dimensional change of the element and a variation in temperature in the reverse scale direction relaxes the element;

force-producing means arranged to apply to said element an external force opposing said internally generated dimensional change, said force being insufficient to prevent said internally generated dimensional change but sufficient to produce a dimensional change of said element in the opposite direction when the element is relaxed in response to a change in temperature in said reverse scale direction;

input signal means to receive said control signal; and

means connected to said input signal means and responsive to the applied control signal to controllably alter the temperature of said element to any temperature within said temperature range, and to maintain such temperature as required to hold said output device at the position corresponding to the value of said control signal, with internally generated dimensional changes and opposite external-force-produced dimensional changes serving together cooperatively to provide contraction and expansion of said element of relatively large magnitude as required to position said output device to any position within the predetermined range of positions in correspondence to the magnitude of said control signal.

3,922,592

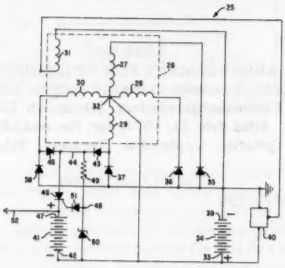
FOUR-PHASE ALTERNATOR BATTERY CHARGER

Chester C. Quantz, Bay City, Mich., assignor to Eltra Corporation, Toledo, Ohio

Filed Mar. 18, 1974, Ser. No. 451,808

Int. Cl.² H02J *7/24*; H02R *9/00*

U.S. Cl. 320—15 **5 Claims**



1. Battery charging apparatus comprising, in combination, a four-phase alternator having a rotor field winding and four stator windings, each stator winding having first and second ends, means connecting said first end of each stator winding to a first terminal to form a star connected circuit, four half-wave rectifiers each having cathode and anode electrodes, means connecting a like electrode of a different one of said rectifiers to the second end of each stator winding, means connecting the other electrodes of said rectifiers to a second terminal, regulating means responsive to the voltage between said first and second terminals for controlling current in said rotor field winding to maintain such terminal voltage at a predetermined level, means for connecting said first and second terminals to a first battery for charging such first battery, and means for charging a second battery from said alternator while such second battery is connected in series with a first battery connected to said first and second terminals, said second battery charging means including a fifth half-wave rectifier having anode and cathode electrodes, means connecting one electrode of said fifth rectifier to the second end of a first of said stator windings with the polarity of said fifth rectifier opposite the polarity of the rectifier connected between such first stator winding and said second terminal, and means for connecting said first terminal and the other electrode of said fifth rectifier to terminals of such second battery for charging such second battery.

3,922,593

CIRCUIT FOR PRODUCING ODD FREQUENCY MULTIPLE OF AN INPUT SIGNAL

William George McGuffin, Willingboro, and Robert Walter Burgen, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,793

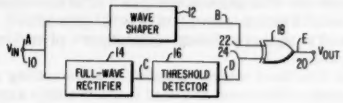
Int. Cl.³ H02M *5/40*

U.S. Cl. 321—4 **13 Claims**

1. A circuit for producing an output signal whose frequency is N times the frequency of its input signal, where N is an odd integer, comprising, in combination:

first means responsive to said input signal for producing a square wave of the same frequency as said input signal and which swings between two levels, one representing one binary value and the other the other binary value;

second means responsive to said input signal for producing an output wave at a level representing one binary value when the amplitude of said input signal is greater than a given threshold level and at a level representing the other binary value whenever the amplitude of said input signal is less than said given threshold level; and

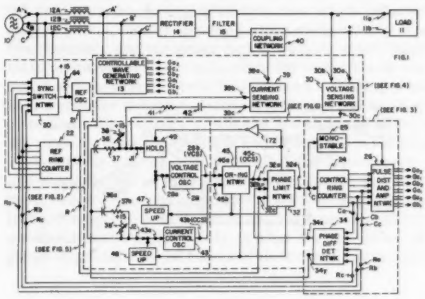


logic circuit means responsive to said square wave and said output wave for producing an output signal at one level when the two waves represent the same binary value and at a second level when said two waves represent different binary values.

3,922,594
CONTROL SYSTEM FOR PHASE DISPLACEMENT REGULATOR CIRCUITS

Harold J. Brown, Lorain, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed Oct. 15, 1974, Ser. No. 514,849
Int. Cl.² H02M 7/12
U.S. Cl. 321—5 **76 Claims**



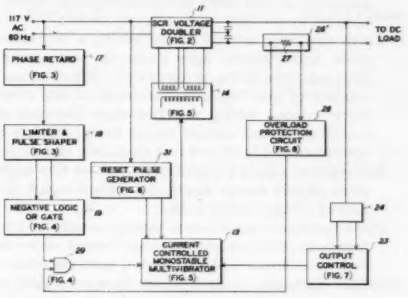
1. A circuit for controlling a regulator circuit of the type which controls its output voltage and current by varying the control angle between an a-c input voltage wave and a control voltage wave comprising, in combination, a control oscillator having an input and an output and serving as means for generating at the output thereof a periodic two-state control signal having a period that varies in accordance with the net signal applied to the input thereof, means for generating a feedback signal that varies in accordance with a signal appearing at the output of the regulator circuit, means for applying the feedback signal to the input of the control oscillator, means for generating a damping signal that varies in accordance with the control angle, a-c coupling means for applying the damping signal to the input of the control oscillator, and means for connecting the output of the control oscillator to the regulator circuit to control the regulating activity thereof.

3,922,595
HIGH POWER REGULATED D.C. SUPPLY

Bruno John Vieri, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 23, 1973, Ser. No. 363,457
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H02M 7/155
U.S. Cl. 321—47 **10 Claims**

1. In a regulated AC to DC converter including a pair of controlled rectifiers which are triggered into conduction selectively during the positive and negative half cycles of the alternating current, an improved triggering means comprising:
a monostable multivibrator for providing a train of output pulses,
means for driving said multivibrator to generate said train of output pulses in predetermined phase relation to the alternating current,
means responsive to the trailing edges of said output pulses for providing a train of trigger pulses,

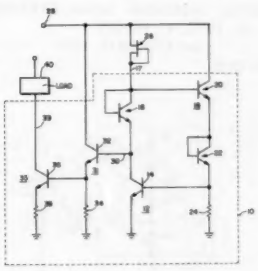

117 V AC 60 Hz
SCR VOLTAGE DOUBLER (FIG. 2)
TO DC LOAD
PHASE RETARD (FIG. 3)
(FIG. 5)
LIMITER & PULSE SHAPER (FIG. 3)
OVERLOAD PROTECTION CIRCUIT (FIG. 6)
RESET PULSE GENERATOR (FIG. 6)
NEGATIVE LOGIC OR GATE (FIG. 4)
(FIG. 4)
CURRENT CONTROLLED MONOSTABLE MULTIVIBRATOR (FIG. 5)
OUTPUT CONTROL (FIG. 7)

means for actuating said controlled rectifiers into conducting states selectively in response to said train of trigger pulses, and
means for providing a control current to said multi-vibrator for controlling the width of the output pulses so as to control the time position of the trigger pulses relative to the phase of the alternating current, whereby the duration of the conduction of the controlled rectifiers in the corresponding half cycle of the alternating current is controlled.

3,922,596
CURRENT REGULATOR

David L. Cave, Mesa, and Walter R. Davis, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Aug. 13, 1973, Ser. No. 387,838
Int. Cl.² G05F 3/08
U.S. Cl. 323—4 **6 Claims**



1. A regulator circuit comprising:
first and second voltage supply means for providing first and second voltages, respectively;
first electronic control means having a control electrode, a first main electrode and a second main electrode, said first main electrode of said first electronic control means being coupled to said second voltage supply means;
second electronic control means having a first main electrode and a second main electrode, said first main electrode of said second electronic control means being cou-

pled to said second main electrode of said first electronic control means;

first current source circuit means coupled between said first voltage supply means and said second main electrode of said second electronic control means;

third electronic control means having a control electrode, a first main electrode, and a second main electrode, said control electrode of said third electronic control means being coupled to said second main electrode of said second electronic control means, and said second main electrode of said third electronic control means being coupled to said first voltage supply means;

fourth electronic control means having a first main electrode, and a second main electrode, said second main electrode of said fourth electronic control means being coupled to said first main electrode of said third electronic control means, said first main electrode of said fourth electronic control means being coupled to said control electrode of said first electronic control means;

first resistive means coupled between said first main electrode of said fourth electronic control means and said second voltage supply means;

fifth electronic control means having a control electrode, a first main electrode and a second control electrode, said control electrode and said second main electrode of said fifth electronic control means being coupled, respectively, to said first main electrode of said second electronic control means and said first voltage supply means;

second resistive means coupled between said second voltage supply means and said first main electrode of said fifth electronic control means;

sixth electronic control means having a control electrode, a first main electrode and a second main electrode, said control electrode and said second main electrode of said sixth electronic control means being coupled, respectively, to said first main electrode of said fifth electronic control means and to an output terminal of said regulator circuit; and

third resistive means coupled between said second voltage supply means and said first main electrode of said sixth electronic control means.

3,922,597

CIRCUIT FOR DETECTING A PHYSICAL QUANTITY

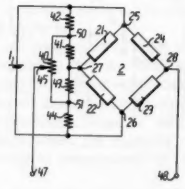
Hiroshi Nagase, Nagoya, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Oct. 29, 1973, Ser. No. 410,499

Claims priority, application Japan, Oct. 31, 1972, 47-109626; Oct. 31, 1972, 47-109627

Int. Cl.² G01L 1/22

U.S. Cl. 323—75 B **4 Claims**



1. A circuit for detecting a physical quantity which may be adjusted without affecting thermal zero shift characteristics, comprising:

a bridge circuit including four sensitive elements coupled in four respective arms thereof, two input and two output terminals, and sensitive elements each having a resistivity which is variable in proportion to a physical quantity to be applied thereto;

variable resistor means including a first fixed resistor having an adjustable tap connected thereto for providing a variable resistance output, whereby adjustment of said tap does not change the thermal characteristics of said first fixed resistor;

second and third resistors connected in series and coupled in parallel with a first arm of said bridge circuit,

fourth and fifth resistors connected in series and coupled in parallel with a second arm of said bridge circuit, said first and second arms being adjacent arms of said bridge circuit,

said first fixed resistor coupled to a connecting point between said second and third resistors and to a connecting point between said fourth and fifth resistors whereby said first fixed resistor is coupled in parallel with said third and fourth resistors.

3,922,598

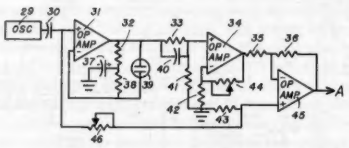
HEMATOCRIT MEASUREMENTS BY ELECTRICAL CONDUCTIVITY

Robert R. Steuer, 1744 E. 3045 South, Salt Lake City, Utah 84106, and Glenn G. Enke, 2925 Regent Ave., Minneapolis, Minn. 55422

Filed Aug. 15, 1974, Ser. No. 497,553

Int. Cl.² G01N 27/42

U.S. Cl. 324—30 R **6 Claims**



1. An apparatus for displaying in digital form the volume percentage of red cells in a conducting fluid sample comprising:

a. 2 spaced electrodes cooperating with said fluid sample;

b. a sinusoid alternating current source having its constant current output connected to said electrodes;

c. a variable gain amplifier having its input terminals connected to said electrodes;

d. a differential amplifier having its input terminals connected between the output of said variable gain amplifier and the constant voltage output of said alternating current source;

e. rectifying means and DC amplifier connected to the output of said differential amplifier;

f. a dynamic attenuating resistive network, whose output voltage approximates the volume percentage of red red cells in said fluid sample, driven by the output of said DC amplifier;

g. means operable to render said attenuating network output substantially independent of temperature variations of said fluid sample; and

h. digital display means driven by the output of said attenuating network to provide direct readout of either the volume percentage of red cells in said fluid sample or the hemoglobin estimate of said fluid sample.

3,922,599
A.C. ELECTROMAGNETIC THICKNESS GAUGE UTILIZING PREMAGNETIZATION OF THE GAUGE CORE TO RENDER SENSITIVITY INDEPENDENT OF THICKNESS

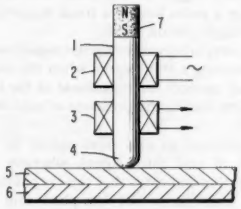
Erich Steingroever, Bonn, and Hans F. Nix, Cologne, both of Germany, assignors to Elektro-Physik, Hans Nix & Dr. -Ing. E. Steingroever KG., Cologne, Germany

Filed Aug. 28, 1974, Ser. No. 501,354

Claims priority, application Germany, Sept. 12, 1973, 2345848

Int. Cl.² G01R *33/12*

U.S. Cl. 324—34 **26 Claims**



1. In electromagnetic thickness gauges for measuring the thickness of a layer applied to a base wherein the applied layer and the base are composed of two dissimilar materials one of sid two materials having a composition which influences a magnetic field, such as ferromagnetic and electrically conductive materials, and the gauge includes a core of soft magnetic material having a single pole piece for contact with the exposed surface of the layer to be measured and being provided with means for inducing electrical values in a measuring coil associated with said core by subjecting the core to an alternating magnetic field, the electrical values induced in the measuring coil being a function of the strength of the magnetic field and the thickness of the layer being measured, the improvement which comprises means for adjustably pre-magnetizing said soft magnetic core by subjecting the core to an additional uni-directional magnetic field to alter the sensitivity of the gauge to predetermined values of thickness to be measured.

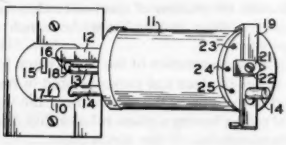
3,922,600
ELECTRICAL RECEPTACLE TESTER FOR TESTING THE MECHANICAL AND ELECTRICAL CHARACTERISTICS OF ELECTRICAL SERVICE RECEPTACLES

Denes Roveti, 15 Lincoln Park Center, Annapolis, Md. 20401

Filed Jan. 2, 1974, Ser. No. 429,722

Int. Cl.² G01R *31/02;* **G01N** *19/02;* **H01R** *13/62*

U.S. Cl. 324—51 **5 Claims**



1. Apparatus for testing electrical receptacles, said apparatus comprising a housing, at least one projection from said housing adapted to be received by receptacle power contacts, means supported by said housing for tending to remove said projection from said receptacle to indicate the grip of the contacs, means supported by said housing for applying a prescribed torque to said receptacle contacts through said projection to test the resistance of siad receptacle to mechanical deformation, said means for applying a prescribed torque comprising a shaft rotatably supported by said housing, and a resilient means coupling said shaft to said housing to resist rotation of said shaft until said prescribed torque is exerted.

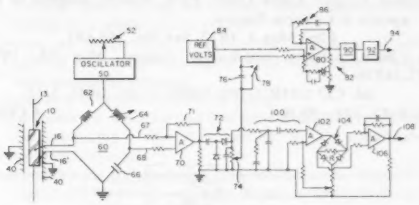
3,922,601
SPIRAL PLATE YARN MEASURING CAPACITANCE CELL

James H. Martin, Jr., Waynesboro, Va., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Mar. 1, 1974, Ser. No. 447,254

Int. Cl.² G01R *27/26*

U.S. Cl. 324—61 R **13 Claims**



1. An apparatus for continuously measuring variations along the length of a moving elongate dielectric material, said apparatus comprising: spaced guide means for defining a path for said moving elongate dielectric material; a capacitance cell through which said material passes coaxially for distributing an electric field in a multiplicity of directions around said material within said capacitance cell, said capacitance cell comprising: two helicoid electrical conducting strips insulated from each other and coaxial with said path, said helicoid strips being fixed with respect to each other and in the form of a cylindrical structure with spiralled slots between said strips; and circuit means connected to said capacitance cell for providing said field and for measuring said variations along the length of said material passing through said capacitance cell. **10.** The system of claim **9**, said strips being of equal length.

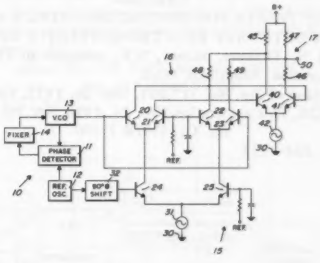
3,922,602
LOCK DETECTOR FOR A PHASE LOCKED LOOP

Richard Eli Lunquist, Pompano Beach, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 11, 1974, Ser. No. 513,976

Int. Cl.² G01R *25/00*

U.S. Cl. 324—83 Q **6 Claims**



1. A lock detector for a phase locked loop including a voltage controlled oscillator and a reference oscillator, said lock detector comprising:

a. a phase detector having first and second inputs and a pair of differential outputs;

b. said phase detector being coupled to the loop with the first input receiving an output signal from the voltage controlled oscillator and the second input receiving an output signal from the reference oscillator;

c. a differential amplifier having a pair of inputs connected to the differential outputs of said phase detector and further having a pair of outputs; and

d. means coupling the differential outputs of said phase detector to the pair of outputs of said differential amplifier for providing a positive feedback to cause said differential amplifier to provide two discrete voltage levels at the outputs thereof.

3,922,603

DEVICE FOR TRANSMITTING FORCE

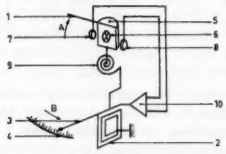
Ernest Jacques Andre Lesur, Paris, France, assignor to Exaprecis S.A., Paris, France

Filed May 2, 1973, Ser. No. 356,681

Claims priority, application France, May 10, 1972, 72.16856

Int. Cl.[2] G01R *17/06*; **G05D** *15/00*; **G01L** *5/12*

U.S. Cl. 324—99 R **4 Claims**



1. A device for transmitting force comprising a movable means for receiving a force; means including a radiation source, a pair of radiation detectors and a differential amplifier associated with said movable means for generating electric current, the value of said electric current being proportional to the degree of movement of said movable means; a rotatably mounted coil and means for delivering said electric current from said generating means to said coil for causing said coil to rotate, by an amount proportional to the value of said current; and spring means mechanically connected between said coil and said movable means; said movable means, said coil and said spring means being arranged such that movement by said coil in response to said current causes said spring means to apply a displacing force on said movable means which opposes the movement of said movable means caused by said first mentioned force.

3,922,604

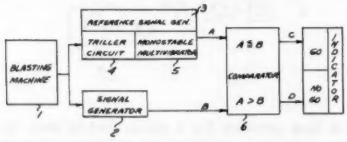
ENERGY TESTER FOR TESTING BLASTING MACHINES THAT DETONATE ELECTRO-EXPLOSIVE DEVICES

Kaushik H. Thakore, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 317,911, Dec. 26, 1972, Pat. No. 3,865,028. This application Feb. 21, 1974, Ser. No. 444,212

Int. Cl.[2] G01R *21/00*

U.S. Cl. 324—111 **3 Claims**



1. An apparatus for determining that the output energy supplied by a blasting machine, which discharges a single pulse of joules of energy to initiate electro-explosive devices, is above a predetermined amount, the apparatus comprising: means for receiving the joules of energy of the single output pulse from said blasting machine and for producing a first signal which is related to the amount of energy of said blasting machine energy pulse, said first signal increasing in magnitude with respect to time;

means for generating a reference signal which is related to a predetermined amount of energy, said reference signal having a predetermined magnitude and predetermined duration, said means for generating a reference signal including a trigger circuit responsive to the receipt of the single output energy pulse from said blasting machine, said trigger circuit having an input resistance greater than 1 million ohms, means for generating a trigger pulse upon receipt of said blasting machine output energy pulse and a monostable multivibrator, having input means for receiving said trigger circuit pulse and output means for producing a pulse having a fixed magnitude in response to said trigger circuit pulse;

means for comparing said reference signal to said first signal and generating a third signal when the magnitude of the first signal exceeds the magnitude of the reference signal at any time during the presence of said reference signal; and

means responsive to said third signal for indicating the presence of said third signal, whereby said indicating means further indicates that the output energy from said blasting machine is not less than said predetermined energy.

3,922,605

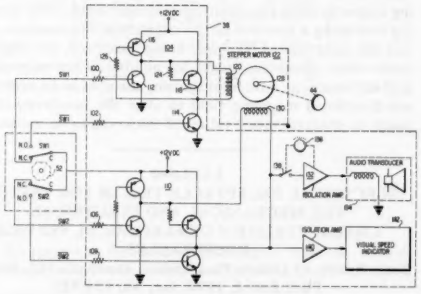
ELECTRICAL WINCH DRUM ROTATION INDICATING SYSTEM

Ivan D. Sarrell, Rising Fawn, Ga., assignor to Koehring Company, Milwaukee, Wis.

Filed Dec. 11, 1974, Ser. No. 531,737

Int. Cl.[2] G01P *3/48*

U.S. Cl. 324—166 **12 Claims**



1. A winch drum movement indicator system for providing an operator of a crane having a winch operated hoist cable with an indication of rotation of the hoist cable winch drum at an operator's station remote from the winch drum, the system comprising:

means responsive to rotation of the winch drum for generating two series of electrical pulses related in frequency to the speed of rotation of the winch drum, the two series of electrical pulses having a phase relationship related to the direction of rotation of the winch drum,

a bi-directional stepper motor responsive to said two series of pulses from said generating means and having an output drive shaft, the output drive shaft being driven at a speed related to the frequency of the two series of pulses and being driven in one direction in response to a first phase relationship between the two series of pulses and in another direction in response to a second phase relationship between the two series of pulses; and,

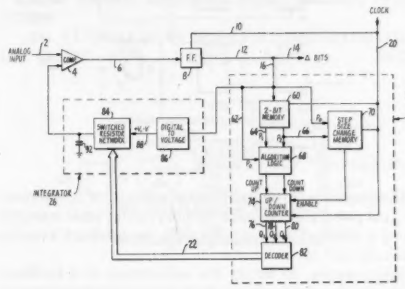
a tactile indicator connected to be driven by the output drive shaft of said stepper motor, said stepper motor and said tactile indicator being mounted on the crane at the

operator's station so as to provide the operator with a tactile indication of the speed and the direction of rotation of the winch drum.

3,922,606
ADAPTIVE DELTA MODULATION INFORMATION TRANSMISSION SYSTEM

K. Fredrik Nordling, Mill Valley, Calif., assignor to Dicom Systems Ltd., British Columbia, Canada

Filed Apr. 8, 1974, Ser. No. 458,806
Int. Cl.² H04L *23/00*
U.S. Cl. 325—38 B **8 Claims**



1. In a delta-modulation system in which digital signals having two senses are employed in a first serial bit stream having a data interval between bits defined by a periodic clock signal to represent an increase or decrease of an analog signal by a predetermined amount, the combination comprising:

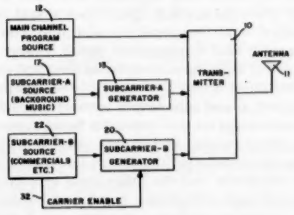
means responsive to said first serial bit stream for providing a second serial bit stream delayed one data interval therefrom and for providing a third serial bit stream delayed two data intervals therefrom, and

means receiving said first, second and third serial bit streams for providing an up count signal on a first output line when the digital signals of said first, second and third serial bit streams are equal in each of the two senses and a down count signal on a second output line when the digital signals of said first and third serial bit streams are equal to each other and not equal to the digital signal of said second serial bit stream in each of the two senses.

3,922,607
RADIO BROADCASTING SYSTEM

Ronald E. Wysong, Dayton, Ohio, assignor to R. L. Drake Company, Miamisburg, Ohio

Continuation of Ser. No. 333,698, Feb. 20, 1973, abandoned. This application Aug. 14, 1974, Ser. No. 497,193
Int. Cl.² H04B *1/00*
U.S. Cl. 325—48 **5 Claims**



1. A broadcast system comprising

a transmitter including

means for generating a first radio frequency signal,

means for modulating said first radio frequency signal with substantially continuous program material,

means for generating a second radio frequency signal,

means for modulating said second radio frequency signal with sequential messages and tone coded address signals identifying the beginning of each of said sequential message; said tone coded address signals including a plurality of standby codes, each directed to a separate family of receivers, and a release code common to all receivers of a predetermined group of families, said plurality of standby codes being transmitted sequentially and followed by a single release code;

means for momentarily lowering the magnitude of said second radio frequency signal at the conclusion of each said sequential message;

a plurality of receivers each including

first means for receiving said first radio frequency signal and for producing a first audio output of said continuous program material,

second means for receiving said second radio frequency signal and for producing audio output including both said sequential messages and said coded address signals,

a loudspeaker system,

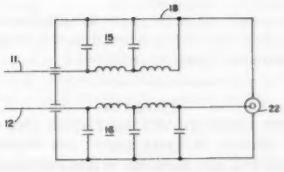
decoding means responsive to selected tone coded address signals and to the magnitude of said second audio frequency signal, said decoding means in said receiver including at least one means responsive to selected said standby codes and means responsive to said release code whereby upon receipt of both said selected standby code and said release code an output is produced, and

switching means responsive to said output of said decoding means and connected to the audio outputs of said first and second receiving means and having an output connected to said loudspeaker system, said switching means includes means for slowly lowering the magnitude of said first audio output to said loudspeaker system while slowly increasing the magnitude of the second audio output to said loudspeaker system upon receipt of selected tone coded address signals occurring at the beginning of a message, said means slowly increasing the level of the first audio output and at the same time decreasing the level of the second audio output upon detecting the lowering of the magnitude of said second radio frequency signal at the end of each message.

3,922,608
ELECTROMAGNETIC INTERFERENCE LOCATOR

Hugh W. Denny, Decatur, Ga., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 29, 1973, Ser. No. 420,238
Int. Cl.² H04B *17/00*
U.S. Cl. 325—363 **4 Claims**



1. A device comprising first and second wires each having one end adapted to be connected across a circuit to be tested; first and second filters each having an input and an output; the other end of said first and second wires being connected respectively to the inputs of said first and second filters; a shield means enclosing said first and second filters; an output

connector having first and second terminals; said first terminal being connected to said shield means; said second terminal being connected to the output of said second filter means; and the output of said first filter being connected to said shield means.

3,922,609

DIGITAL AUTOMATIC FREQUENCY CONTROL LOOP FOR A LOCAL OSCILLATOR

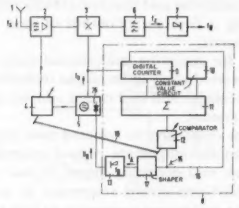
Lothar Grohmann, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 17, 1974, Ser. No. 480,069

Claims priority, application Germany, July 3, 1973, 2333851

Int. Cl.² H04B *1/16*

U.S. Cl. 325—423 **11 Claims**



1. A method for automatically controlling the frequency of a local oscillator in the superheterodyne receiving section of an image-and/or sound-reproduction arrangement, which frequency is adjusted with a tuning arrangement, and which superheterodyne receiving section contains an intermediate frequency circuit for transmitting a stable intermediate frequency and an automatic frequency control loop with a frequency discriminator tuned to a stable frequency wherein a frequency is derived from the local oscillator and compared with the discriminator frequency, the discriminator forms a dc voltage corresponding to the difference between the local oscillator frequency and the discriminator frequency, and a varactor in the local oscillator is controlled with the dc voltage such that the frequency derived from the local oscillator varies in a direction opposite to the direction of control of said dc voltage generated by said frequency discriminator, wherein the improvement comprises:

injecting the continuous waves of the local oscillator output into the automatic frequency control loop;

dividing said continuous waves into an uninterrupted sequence of equally long wave trains whose number of single waves is the difference between the comparative values of the transmitter frequency adjusted to the tuning arrangement and the positive or negative value of the intermediate frequency referenced to a decade value of the transmitter frequency; and

forming a single wave for each wave train whereby the discriminator frequency is equal to the decade value of the transmitter frequency adjusted.

3,922,610

PULSE ANTI COINCIDENCE METHODS AND CIRCUITS

William A. Buchan, Newport Beach, and Harold E. Arns, Chino, both of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 28, 1974, Ser. No. 437,284

Int. Cl.² H03K *5/20;* **H03D** *13/00*

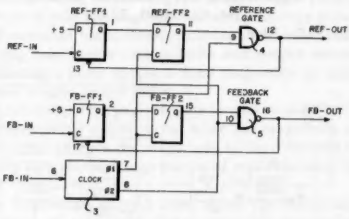
U.S. Cl. 328—109 **8 Claims**

1. A method of preventing coincidence of reference signal pulses and feedback signal pulses in a servo system comprising: supplying the reference signal pulses and the feedback signal pulses to separate input points of an anti-coincidence circuit having separate output points for reference and feedback output pulses; and assigning, by said anti-coincidence circuit separate time zones in which reference and feedback output pulses can occur;

wherein the assigning of separate time zones includes:

a. remembering when a reference signal pulse has occurred by a reference memory circuit;

b. remembering when a feedback signal pulse has occurred by a feedback memory circuit;



c. interrogating, to detect the occurrence of a reference signal pulse, the reference memory circuit while transmitting a feedback output pulse from the feedback memory circuit; and

d. interrogating, to detect the occurrence of a feedback signal pulse, the feedback memory circuit while transmitting a reference output pulse from the reference memory circuit.

3,922,611

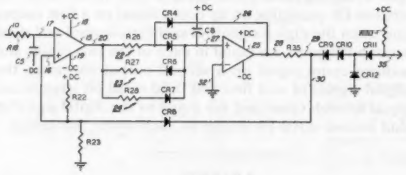
FACSIMILE CARRIER DETECT CIRCUIT

Bruce R. Kanitz, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1973, Ser. No. 418,529

Int. Cl.² H03K *5/18, 5/153*

U.S. Cl. 328—111 **6 Claims**



1. A detector circuit for generating an output control signal in response to a long duty cycle start control signal comprising first and second comparators each having a pair of input terminals and an output terminal, one of the input terminals on each comparator being biased to establish a threshold switching level for each comparator, each comparator generating a first output voltage when a signal applied to the other input terminal is above said switching level and a second output voltage when the applied signal is below said switching level, said other input terminal of said first comparator adapted to receive said start control signal, charge control means for coupling the output terminal of said first comparator to the other input terminal of said second comparator, a capacitor coupled to said other input terminal of said second comparator, the charge on said capacitor being controlled by said charge control means, said charge control means comprising at least two parallel paths between said output terminal of said first comparator and the other input terminal of said comparator, each path including a resistor and a diode, said diodes being poled in opposite directions, and means for controlling said charge control means to charge said capacitor at a first rate in response to said first output voltage from said

first comparator and to discharge said capacitor at a second rate in response to said second output voltage from said first comparator, whereby a predetermined time after receipt of said start control signal the signal at the other input terminal of said second comparator reaches its switching level so that the second comparator generates said output control signal.

3,922,612
MAGNETRON DEVICE

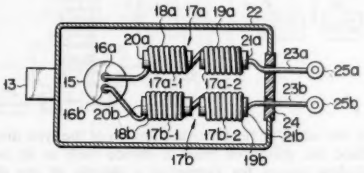
Norio Tashiro, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 24, 1974, Ser. No. 517,613

Claims priority, application Japan, Nov. 12, 1973, 48-127099

Int. Cl.² H01J *29/76*; **H05B** *9/02*; **H01J** *25/50*, *1/52*

U.S. Cl. 328—230 **10 Claims**



1. A magnetron device comprising a magnetron body; means for applying a magnetron field to the magnetron body; a cooling device fitted to the magnetron body; a shield box disposed on that side of the magnetron body which faces a cathode stem; and a noise microwave-absorbing filter received in the shield box, wherein the noise microwave-absorbing filter is composed of a pair of choking members respectively connected to heater lead conductors; each choking member is composed of at least one first choking element including a first ferrite core of high intrinsic resistivity connected to the heater lead conductor and at least one second choking element including a second ferrite core of low intrinsic resistivity connected in series to the first choking element.

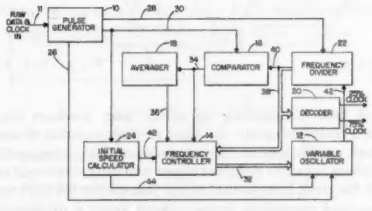
3,922,613
INFORMATION DETECTION APPARATUS HAVING AN ADAPTIVE DIGITAL TRACKING OSCILLATOR

William Reed Allen, Reading, and John D. Delorenzo, Marlboro, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jan. 2, 1975, Ser. No. 537,988

Int. Cl.² G11B *5/45*; **H03K** *5/18*

U.S. Cl. 329—104 **10 Claims**



1. Information detection apparatus comprising:

A. means for receiving a plurality of first signals representative of said information;

B. control means for providing a second signal;

C. oscillator means, responsive to said second signal, for generating a plurality of third signals having a frequency determined by the value of said second signal;

D. means for detecting the generation of said third signals by said oscillator means;

E. bistable means, responsive to each of said first signals, for disabling said oscillator means;

F. means, coupled with said bistable means and responsive to an indication from said means for detecting that said oscillator means is no longer generating said third signals, for reenabling said oscillator means to generate said third signals; and

G. means, responsive to said third signals generated between the time said bistable means is disabled and the time said bistable means is reenabled, for generating a fourth signal and a fifth signal between which one of said plurality of first signals may be detected.

3,922,614
AMPLIFIER CIRCUIT

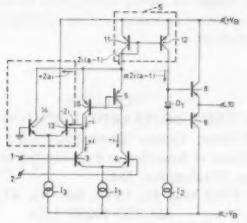
Rody Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 10, 1974, Ser. No. 486,977

Claims priority, application Netherlands, July 13, 1973, 7309767

Int. Cl.² H03F *3/45*

U.S. Cl. 330—30 D **6 Claims**



1. Amplifier circuit, comprising:

a first and a second transistor connected as a differential pair, said first and second transistor each having a main current path;

a first and a second current mirror circuit each having an input circuit between an input terminal and a sum terminal and an output circuit between an output terminal and said sum terminal, for reproducing at said output terminal thereof with fixed gain the current supplied to said input terminal thereof, the gain of said first current mirror circuit being unity, said input circuit of said first current mirror circuit being connected in series with said main current path of said first transistor, said output circuit of said first current mirror being connected in series with said main current path of said second transistor and said input terminal of said second current mirror circuit being connected to said sum terminal of said first current mirror circuit; and

a current amplifier having an input and output, said input of said current amplifier being connected to said output terminal of said first current mirror circuit and said output of said current amplifier being connected to said sum terminal of said first current mirror circuit.

3,922,615
DIFFERENTIAL AMPLIFIER DEVICE

Norio Sobajima, Fuchu, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 29, 1973, Ser. No. 410,503

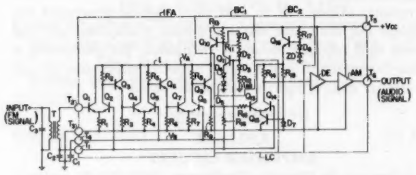
Claims priority, application Japan, Oct. 27, 1972, 47-107225

Int. Cl.² H03F *3/68*

U.S. Cl. 330—30 D **9 Claims**

1. In a differential amplifier device including at least one emitter-coupled differential amplifier, and at least one emitter

follower circuit directly connected on the output side of the differential amplifier, a bias circuit comprising a first transistor which has an input electrode and first and second output electrodes, at least one constant-voltage element connected between said first output electrode of said transistor and a source of second reference potential, a first resistance connected between a source of first reference potential and said



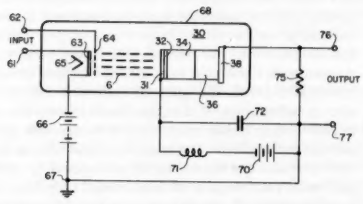
input electrode of said transistor and a second resistance connected between said input electrode of said transistor and said source of second reference potential, said second output electrode of said transistor being connected to said input electrode thereof through said first resistance, an input of said differential amplifier being connected to the point between said first resistance and said second resistance to obtain a bias voltage therefrom.

3,922,616

ELECTRON BOMBARDED SEMICONDUCTOR

Maurice Weiner, Ocean Township, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,319
Int. Cl.² H03F *3/54*
U.S. Cl. 330—44 **4 Claims**



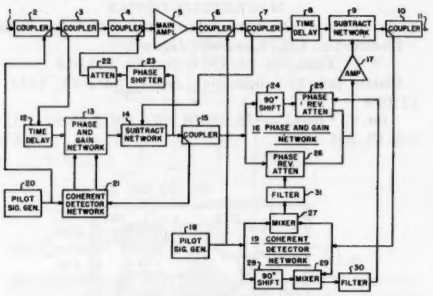
1. A silicon semiconductor diode target comprising:
an intrinsic layer of semiconductor material;
an n^+ region on one side of said intrinsic layer, said intrinsic layer having a thickness of less than 20 microns;
a p^+ region on the other side of said intrinsic layer where said p^+ region has a thickness of 0.2 microns;
a conductive terminal layer having one total surface area in contact with said p^+ region and extending across the entire surface area of said p^+ region on the side opposite said intrinsic layer, said p^+ region and said conductor terminal layer being together cumulatively less than 0.275 microns thick to permit the passage of high velocity bombarding electrons; and
a conductive mounting terminal, conductively bonded to said n^+ region, said conductive mounting terminal and said conductive terminal layer providing the electrical terminals of said semiconductor diode.

3,922,617

ADAPTIVE FEED FORWARD SYSTEM

William B. Denniston, Bellmore, and Robert F. Hertz, Kings Park, both of N.Y., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 18, 1974, Ser. No. 524,680
Int. Cl.² H03F *1/32*
U.S. Cl. 330—149 **5 Claims**



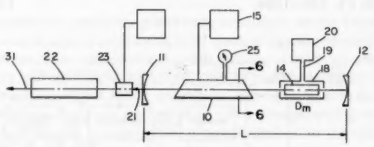
1. An adaptive feed forward system of the type designed to reduce the distortion from a device such as an amplifier, including means for extracting a sample of the distortion products from the output of said device, adjustable means for equalizing said sample and the products remaining in the output after extracting the sample, means for subtractively combining said equalized sample and remaining products to produce a distortion-reduced system output, and means including pilot signal generator and coherent detector means for automatically adjusting said equalizing means to compensate for uncontrolled variations in the system components, wherein the improvement comprises:
a. means for extracting a sample of the system output, and
b. means for applying said sample of the system output to said coherent detector means.

3,922,618

MULTIPLE TRANSITION LASER

Ali Javan, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 28, 1974, Ser. No. 473,431
Int. Cl. H01s *3/22*, *3/10*
U.S. Cl. 331—94.5 M **21 Claims**

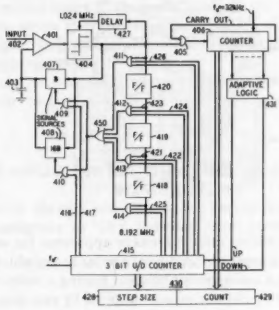


1. A laser comprising an active laser medium disposed within a resonant cavity, the laser medium capable of supporting laser oscillations at different frequencies corresponding to transitions between different upper and different lower energy states, the peak frequencies of the gain curves for selected first and second transitions being spaced apart a predetermined characteristic amount $D_{1,2}$, in the microwave range, of value dependent upon the nature of the laser medium, an optical modulator disposed within said laser cavity and a modulating source for driving said modulator to modulate radiation in said cavity at frequency D_m corresponding substantially to $D_{1,2}$ to establish through generation of a side band, stable laser oscillations at first and second frequencies corresponding to the gain curves of said first and second transitions.

3,922,619
COMPRESSED DIFFERENTIAL PULSE CODE MODULATOR

John Stewart Thompson, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 28, 1974, Ser. No. 437,155
Int. Cl.² H03K *13/22*
U.S. Cl. 332—11 D **6 Claims**



1. An adaptive DPCM transmission system including an encoder for generating a compressed linearizable DPCM code corresponding to a portion of an input analog signal wherein said encoder comprises

a. an adaptive delta modulator comprising means for storing a reference signal representing a current step size,

b. means for accumulating a net count of the output signals of said delta modulator over a period T,

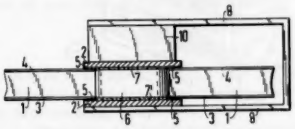
c. means responsive to said net count for adjusting said step size comprising means for changing said reference signal by an amount indicated by a corresponding value for said net count, and

d. output register means responsive to said means for accumulating, said output register means forming a composite signal wherein said composite signal comprises said net count and said reference signal before being changed.

3,922,620
CIRCULATOR WITH CONNECTING ARMS DESIGNED IN ACCORDANCE WITH THE MIC TECHNIQUE

Josef Deutsch, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 24, 1973, Ser. No. 409,251
Claims priority, application Germany, Oct. 30, 1972, 2253175
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H01P *1/38*
U.S. Cl. 333—1.1 **2 Claims**

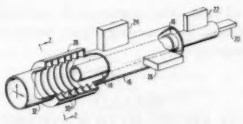


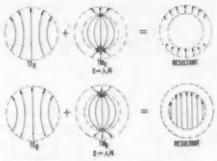
1. A circulator comprising a disc of gyromagnetic material, connecting arms for forming a branch line, said disc disposed in the zone of branching, said connecting arms constructed in accordance with microwave integrated circuit technique and comprising a plate of dielectric material surrounding said gyromagnetic disc, a continuous metal layer carried on a first side of said dielectric plate, separate connecting arm metal layers carried on the second side of said dielectric plate, a permanent magnet adjacent said disc on said second side of said dielectric plate, a first pole piece of magnetic material carrying a highly conductive metal coating disposed between said permanent magnet and said connecting arm layers and electrically connected to said connecting arm layers, a second pole piece carrying a highly conductive metal coating disposed adjacent and electrically connected to said continuous metal layer, a magnet yoke connecting said permanent magnet and said second pole piece, and an insert of dielectric material having a dielectric constant which is smaller than the dielectric constant of said gyromagnetic disc disposed between said first pole piece and said gyromagnetic disc.

3,922,621
6-PORT DIRECTIONAL ORTHOGONAL MODE TRANSDUCER HAVING CORRUGATED WAVEGUIDE COUPLING FOR TRANSMIT/RECEIVE ISOLATION

Robert Walter Gruner, Gaithersburg, Md., assignor to Communication Satellite Corporation, Washington, D.C.

Filed June 3, 1974, Ser. No. 476,028
Int. Cl. H01p *1/16, 5/12*
U.S. Cl. 333—11 **3 Claims**





1. In a directional orthogonal mode transducer including an inner, circular waveguide for propagating a first signal and a surrounding, outer, coaxial waveguide for propagating a second signal having a lower frequency than the first signal, an improved signal coupling section comprising:

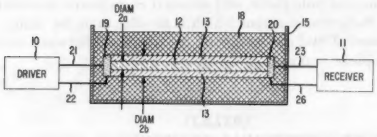
a. a cylindrical waveguide axially aligned with and attached to one end of the outer waveguide and having a diameter greater than that of the outer waveguide, and

b. a plurality of inwardly projecting corrugations spaced around the inner periphery of the cylindrical waveguide, said corrugations being dimensioned and configured to produce, by reason of their surface reactance effect, resultant electric field distribution patterns in the form of a central core of energy with a surrounding, void annular ring for the first signal, and an annular ring of energy with a central void for the second signal, whereby the first and second signals are substantially isolated from each other with the first signal coupling to the inner waveguide and the second signal coupling to the outer waveguide.

3,922,622
ELASTIC WAVEGUIDE UTILIZING AN ENCLOSED CORE MEMBER

Gary Delane Boyd, Rumson, and Larry Allen Coldren, Leonardo, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1974, Ser. No. 496,645
Int. Cl.² H03H *9/02, 9/26, 9/30*
U.S. Cl. 333—30 R **30 Claims**

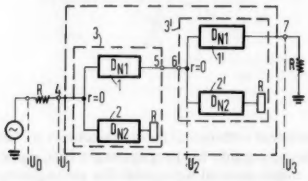


2. In a waveguide for elastic waves,
a core region of a material in which bulk elastic waves can be propagated, said core region having a diameter which is at least two wavelengths of elastic wave energy at the cutoff frequency f_{co} of the lowest mode for said waveguide,
a cladding region enclosing all surfaces except end surfaces of said core region, said cladding region also being of a material in which bulk elastic waves can be propagated, and
at least one of said core region and said cladding region including means for focusing elastic wave energy toward said core region.

3,922,623
ELECTRICAL FILTER WITH A NYQUIST FLANK CHARACTERISTIC

Erwin Bucherl, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 20, 1973, Ser. No. 389,807
Claims priority, application Germany, Aug. 22, 1972, 2241159
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H03H *7/04;* **H04B** *1/68*
U.S. Cl. 333—70 R **6 Claims**

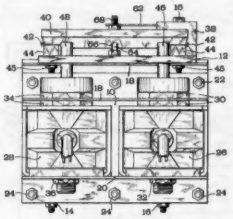


1. An electrical filter with a Nyquist flank characteristic for generating a vestigial side band comprising two identical strict divider filters each having a first filter section and a second filter section, the output of the first section of said first divider filter being connected to the input of the first section of the second divider filter, the circuit parameters being such that a signal injected at the input of said first divider filter will pass through said first section of said first filter and through the first section of said second filter with the same attenuation characteristic, said second section of each of said first and second filters being terminated in identical ohmic resistances, the attenuation functions D_{N1} and D_{N2} of said first and second filter sections of each of said divider filters being self-reciprocal functions.

3,922,624
AUTOMATIC CIRCUIT RESTORATION DEVICE FOR POLYPHASE SUPPLY LINES

Pietro Basile, Via Gramsci 146, S. Giovanni In Fiore, Italy

Claims priority, application Italy, Aug. 17, 1973, 86275/73
Int. Cl.² H02H *3/08*
U.S. Cl. 335—26 **4 Claims**

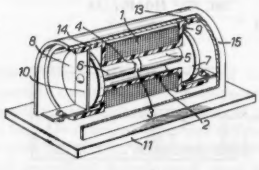


1. A self-restoring circuit breaker apparatus for an electric power supply having a plurality of feeder lines, which apparatus comprises a main circuit breaker having a main operating coil energized by electric power supplied by one of said feeder lines, said main circuit breaker having plural sets of switching contacts each set being connected in series with a corresponding feeder line at a monitoring point thereon, said sets of switching contacts being operable by the main operating coil in unison upon a given deenergization of said main operating coil to establish respective open circuit conditions in all of said feeder lines to interrupt the flow of power beyond each monitoring point; a plurality of auxiliary operating coils each connected to a corresponding one of the remaining feeder lines for energization thereby; and switching means connected in series with said main operating coil and operated by said auxiliary operating coils upon a given deenergization of any one of them to establish an open circuit interrupting the supply of power to the main operating coil, whereby a fault in the feeder line supplying the main operating coil will effect interruption of power on all feeder lines, and a fault in any other feeder line will also effect interruption of power on all feeder lines.

3,922,625
ELECTRO-MAGNETIC RELAYS

Samuel Stewart Hall, Hornchurch, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Apr. 24, 1974, Ser. No. 463,822
Claims priority, application United Kingdom, Apr. 27, 1973, 20273/73
Int. Cl.² H01H *1/44*
U.S. Cl. 335—196 **4 Claims**



1. An electromagnetic relay comprising:
a base;
a hollow bobbin mounted on said base;
an energizing coil wound on said hollow bobbin;
a pair of flat-faced spring strips mounted on said base;
a pair of electrically conductive plungers in axial alignment within said hollow bobbin adapted to move into abutting

contact with each other in response to magnetic force generated by energization of said energizing coil and comprising contact means on the adjacent ends thereof and flange means on the remote ends thereof comprising flat engaging surfaces presented toward the flat faces of said spring strips, said spring strips electrically and mechanically engaging said flange engaging surfaces with the flat faces of said spring strips in intimate engagement with the flat engaging surfaces of said flange means thereby electrically and mechanically connecting said plungers to said spring strips so that said plungers are biased by said spring strips in a direction opposite to the direction of plunger movement resulting from energization of said energizing coil; and

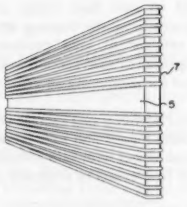
terminals mounted on said base for conducting electric current to and away from the electromagnetic relay.

3,922,626

WIDE ANGLE DEFLECTION YOKE QUADRUPOLE WINDINGS

Frederick A. Hovey, and Charles E. Torsch, both of Geneva, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 7, 1974, Ser. No. 521,698
Int. Cl.² H01F *7/00*
U.S. Cl. 335—213 **7 Claims**



1. A deflection yoke for a cathode ray tube comprising:

a first core of magnetic material formed to telescope over the neck portion of a cathode ray tube;

a first pair of windings having a plurality of spaced turns toroidally wrapped in a first level on said core, said pair of windings effecting electron beam deflection in a first plane;

a second pair of windings having a plurality of spaced turns toroidally wrapped on said core, said spaced turns interleaved with said spaced turns of said first pair of windings to provide a solid first level of turns and forming a second level of spaced turns; said pair of windings effecting electron beam deflection in a second plane perpendicular to said first plane; and

first, second, third, and fourth quadrupole windings having a plurality of spaced turns toroidally wrapped on said core and interleaved with said spaced turns of said second level of said second pair of windings.

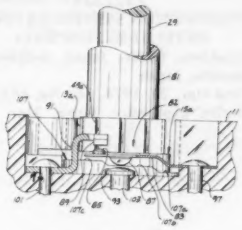
3,922,627

DOUBLE THROW SINGLE POLE SWITCH

Glen C. Shepherd, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1973, Ser. No. 425,647
Int. Cl.² H01H *3/00*
U.S. Cl. 337—68 **4 Claims**

1. A double-throw single-pole switch comprising a resilient movable contact arm having one end fixed and the other free and carrying a first contact on one surface of the free end thereof for engagement with a mating stationary second contact, said contact arm carrying on its opposite surface a third contact positioned intermediate the fixed and free ends thereof for engagement with a mating stationary fourth contact, and a cam engageable with said contact arm for selectively applying force to the contact arm intermediate the



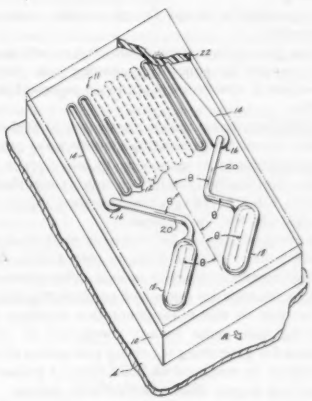
free and fixed ends thereof for moving the contact arm to make and break said first and second contacts and to break and make said third and fourth contacts.

3,922,628

STRAIN GAGE

John M. Hudson, and John E. Axley, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 3, 1970, Ser. No. 60,664
Int. Cl.² G01L *1/22*
U.S. Cl. 338—2 **3 Claims**



1. A strain gage comprising

a backing strip

a strain grid bonded to the upper surface of the backing strip and comprising a relatively thin, elongated serpentine conductor having parallel lengths,

said backing strip being adapted to be bonded to a test specimen with the parallel grid lengths aligned with the direction of major stress,

said grid having terminal lengths at its opposite sides which are progressively widened toward the ends thereof, and

a pair of relatively thick, elongated tabs bonded to said backing strip with integral connectors, also bonded to the backing strip, respectively extending to and bonded to the widened end of terminal lengths of the grid, said connectors being relatively thin at their ends which are bonded to the grid terminal lengths and progressively increasing in thickness along at least a portion of their lengths such that the thickness of said connectors approaches the thickness of said elongated tabs at the interconnection therewith, said tabs and the portions of the connectors

extending from said terminal grid lengths being disposed on an angle θ of between about 45° and 65° relative to the direction of the lengths of the strain grid.

3,922,629

OBJECT DETECTION SYSTEM HAVING FAULT DETECTION FUNCTION

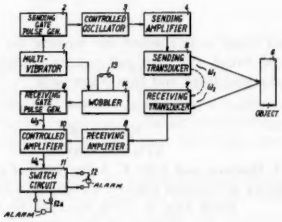
Michitaro Hayakawa, Chofu, Japan, assignor to Kabushiki Kaisha Seidensha, Japan

Filed Mar. 20, 1974, Ser. No. 453,084

Claims priority, application Japan, Mar. 24, 1973, 48-33971

Int. Cl.² G01S 9/66

U.S. Cl. 340—1 R **6 Claims**



1. An object detection system using ultrasonic wave pulses, comprising:

pulse generation means for generating pulses at desired intervals;

sending gate pulse means connected to said pulse generation means for generating sending gate pulses of short duration in synchronism with said pulses of desired intervals;

controlled oscillator means connected to said sending gate pulse means for generating electric wave pulses;

a sending transducer responsive to said electric wave pulses and electrically coupled to said controlled oscillator means for generating ultrasonic wave pulses in response to said electric wave pulses;

a receiving transducer for receiving ones of said ultrasonic wave pulses reflected from an object to be detected;

wobbler means connected to said pulse generating means for developing an output of controllably delayed pulses generated by said pulse generation means;

receiving gate pulse means connected to said wobbler means for generating receiving gate pulses of appropriate duration in response to said delayed pulses of desired intervals to gate said reflected wave pulses;

controlled amplifier means responsive to said receiving gate pulses and connected to said receiving gate pulse means and said receiving transducer for gating the output of said receiving transducer in response to said receiving gate pulses;

switch means connected to said controlled amplifier means for obtaining at least one alarm signal in response to the output of said controlled amplifier means; and

alarm means connected to said switch means for indicating at least one alarm in response to said alarm signal.

3,922,630

AUTOMATIC VEHICLE POSITIONING SYSTEM

Francis J. Murphree, Sunnyside, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1964, Ser. No. 415,825

Int. Cl.² G01S 9/66, 3/80

U.S. Cl. 340—3 R **21 Claims**

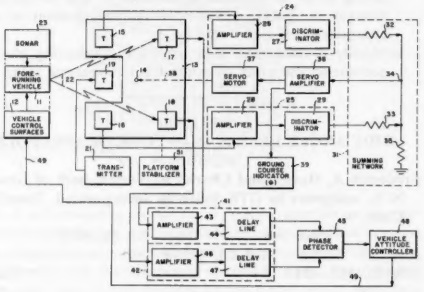
1. Means for navigating a plurality of substantially tandemly disposed vehicles along the predetermined course of one thereof comprising in combination,

a first vessel,

means mounted on said first vessel for determining the course thereof and aligning a predetermined reference means therewith,

a second vessel adapted for being driven in tandem with said first vessel,

means mounted on said second vessel for broadcasting a predetermined signal indicating the bearing thereof,



means attached to said first vessel course determining means for determining the bearing deviation of said second vessel relative to said predetermined reference means in response to said second vessel bearing indication signal and for producing an error signal proportional thereto,

means connected between said second vessel bearing deviation determining means and said second vessel for aligning said second vessel with said reference means and the course of said first vessel in response to said error signal.

3,922,631

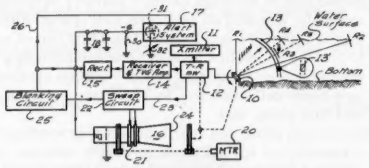
UNDERWATER INTRUSION DETECTING SYSTEM

John H. Thompson, Pittsburgh, Pa., and David S. Sims, Ellicott City, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 20, 1960, Ser. No. 37,535

Int. Cl.² G01S 9/68

U.S. Cl. 340—3 R **4 Claims**



1. An acoustic barrier for detecting and classifying a body intruding into a protected volume of water comprising a high resolution active sonar apparatus including a transmitting transducer submerged in the protected volume of water and having a vertically oriented fan shape directivity pattern with its principal axis slanted toward a bounding surface, means for rotating said transmitting transducer in azimuth about a vertical axis, means for pulsing said transmitting transducer t times per second, and means for displaying in PPI presentation the flutter echoes returned from said bounding surface with spot positions in the presentation being functions of the azimuth and slant ranges of the echo origins, said displaying means including a receiving transducer having a vertically oriented fan shape directivity pattern with its principal axis slanted toward said bounding surface and a beam width in azimuth in

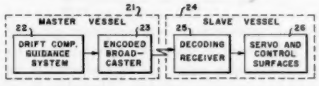
degrees equal to 2θ, and said receiving transducer being mounted for rotation in assembly with said transmitting transducer and being so oriented that its principal axis lags behind the principal axis of said transmitting transducer by an azimuthal angle of θ° where

wherein ω equals the angular velocity in degrees per second at which said transducers are rotated.

3,922,632
AUTOMATIC VEHICLE POSITIONING SYSTEM

Francis J. Murphree, Sunnyside, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 14, 1965, Ser. No. 513,810
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—3 R **8 Claims**



1. An automatic vehicle positioning system comprising in combination:

means for producing a signal proportional to the drift angle of a moving master vessel having spurious ambient forces applied thereto which causes the drift thereof from an intended ground course;

a pair of receiving transducers for receiving a predetermined signal broadcast from a slave vehicle intended to be navigated along the aforesaid intended master vessel ground course;

a variable phase shifter having a control input, a controlled input, and an output, with the control input thereof coupled to the output of said drift angle proportional signal producing means;

a local oscillator, with the output thereof coupled to the controlled input of said variable phase shifter;

a first mixer having a pair of inputs and an output, with one of the inputs thereof coupled to the output of said local oscillator, and the other of the inputs thereof coupled to the output of one of the aforesaid pair of receiving transducers;

a second mixer having a pair of inputs and an output, with one of the inputs thereof connected to the other of said pair of receiving transducers, and the other input thereof connected to the output of said variable phase shifter;

a pair of bandpass filter means respectively connected to the outputs of said first and second mixers;

a phase detector effectively coupled to the outputs of said pair of bandpass filter means for producing an error compensating signal proportional to the phase relationship of the outputs thereof;

means mounted on said master vessel and connected to the output of said phase detector for effectively broadcasting said error compensating signal towards the slave vehicle to be navigated;

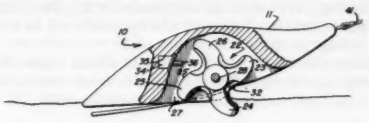
means mounted on said slave vehicle for receiving the error compensating signal broadcast by the aforesaid broadcasting means and for converting same into a navigation control signal proportional thereto; and

means connected to the output of said immediately preceeding receiving and converting means and mounted on said slave vehicle for the steering thereof toward the intended ground course of said master vessel in response to the aforesaid navigation control signal.

3,922,633
INSULATED CONDUCTOR DETECTOR

Francis J. Higgins, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 20, 1967, Ser. No. 655,721
Int. Cl.[2] B63C 11/48
U.S. Cl. 340—4 R **10 Claims**



1. An insulated conductor detector and cutter comprising in combination:

a weighted housing;

a wheel, having a predetermined plurality of radially extending cutting blades, mounted for rotation in said housing in such manner that one of the cutting blades thereof protrudes from the lowest frontal extremity of said housing;

means effectively interconnecting said housing and said wheel for preventing the rotation thereof until a predetermined force is applied to the cutting edge of one of the cutting blades thereof;

a groove of predetermined diameter extending around the lowest frontal extremity of said housing on each side of said protruding cutting blade;

a pair of electromagnetic energy windows disposed immediately behind predetermined portions of said groove, with one thereof located on one side of said protruding cutting blade and the other thereof located on the other side of said protruding cutting blade;

means mounted in said housing and contiguously disposed with one of said windows for broad-casting electromagnetic energy therethrough;

means mounted in said housing and contiguously disposed with the other of said windows for receiving electromagnetic energy passing therethrough;

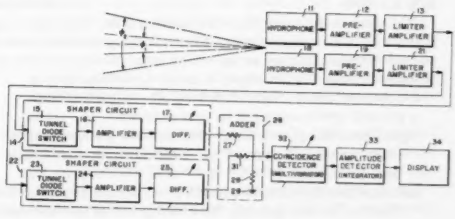
means connected to the output of said electromagnetic energy receiving means for indicating the electromagnetic energy received thereby; and

means connected to the input of the aforesaid electromagnetic energy broadcasting means for supplying electrical power thereto.

3,922,634
SONAR SYSTEM

Henry L. Warner, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 29, 1965, Ser. No. 492,358
Int. Cl.[2] G01S 3/80
U.S. Cl. 340—6 R **16 Claims**



1. Means for varying the beamwidth of a phase-comparison sonar receiver comprising in combination,

a pair hydrophones, each of which is faced along a predetermined axis, and each of which is spatially disposed a predetermined distance from the other,

variable means connected to the outputs of said hydrophones for selectively and respectively generating a pair of rapid-rise marker pulses whenever the negative-going zero-crossing portion of an acoustical wavefront impacts thereon,

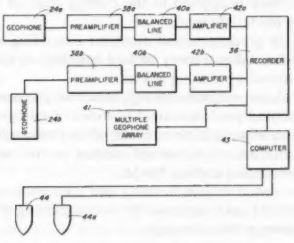
means connected to said marker pulse generating means for adding predetermined amplitudes of the pair of marker pulses generated thereby and for producing an electrical voltage proportional thereto, and

means effectively connected to said adding means for reading out the electrical voltage therefrom in terms of both broad and narrow sonar receiver beamwidths.

3,922,635
METHOD OF LOCATING AND DESTROYING WATER BORNE TARGETS

Gabriel M. Colvin, Laurel, and Robert J. Urick, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1969, Ser. No. 849,278
Int. Cl.² G01S *3/80*
U.S. Cl. 340—6 R **6 Claims**



1. A method of detecting water borne vessels comprising the steps of:

positioning at least one unidirectional vibration responsive transducer in the bed material beneath a body of water; and

sensing the vibrations of said bed material produced by vessels in said body of water by means of said transducer.

3,922,636
SURVEILLANCE SYSTEM FOR MONITORING TRAFFIC IN LOCALIZED AREAS OF A ROUTE

Jean-Raymond Narbaits-Jaureguy, and Henri Billottet, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 2, 1973, Ser. No. 375,470
Claims priority, application France, July 7, 1972, 72.24749
Int. Cl.² G01S *9/02;* **G08G** *1/12*
U.S. Cl. 340—24 **5 Claims**

1. A system for surveying traffic along a route, comprising:

a plurality of detectors fixedly disposed along said route, each of said detectors having an operating range limited to a predetermined route section respectively assigned thereto;

a communication channel linking all said detectors;

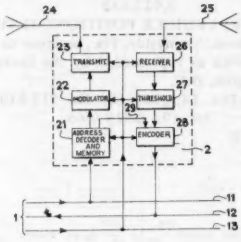
a control post connected to said channel;

signal-generating means at said control post operable to emit over said channel an address code identifying a selected detector;

address-decoding means at each detector connected to said channel for recognizing the corresponding address code;

answer-back means at each detector connected to said channel for transmitting a characteristic signal to said control post in an operative condition of the detector;

monitoring means at each detector including a transmitter connected to said address-decoding means and provided with a first antenna for sending out electromagnetic wave energy in reponse to said corresponding address code, a receiver provided with a second antenna loosely coupled to said first antenna for feeding back wave energy to said answer-back means in said operative condition, and threshold means between said receiver and said answer-back means for discriminating between a relatively high energy level indicative of the proximity of a vehicle and a relatively low level indicative of the absence of vehicles from the assigned route section; and

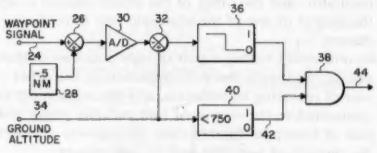


indicator means connected to said channel at said control post for distinguishing between the absence of a characteristic signal, a low-level characteristic signal and a high-level characteristic signal from any detector addressed by said signal-generating means.

3,922,637
AIRCRAFT LANDING APPROACH GROUND PROXIMITY WARNING SYSTEM

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Oct. 3, 1974, Ser. No. 511,757
Int. Cl.² G08G *5/00;* **B64C** *13/50*
U.S. Cl. 340—27 R **11 Claims**



1. A ground proximity warning system having signal input terminals effective to receive waypoint signals and ground-altitude signals for providing warning of descent below a minimum terrain-altitude comprising:

conversion means responsive to the waypoint signal for converting said waypoint signal into a signal representing a predetermined minimum approach altitude;

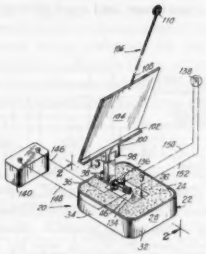
comparison means connected to said conversion means and to the terminal for receiving the ground altitude signal for comparing said minimum approach altitude signal to the ground altitude signal; and

means responsive to said comparing means for generating a minimum altitude warning signal indicative of a predetermined relation between the aircraft's ground altitude and said minimum altitude signal.

3,922,638
PARKING COMPENSATOR

Jack Mendelsohn, 108-49 63rd Ave., Forest Hills, N.Y. 11375

Filed May 3, 1974, Ser. No. 466,606
Int. Cl.² G08G *1/14;* **G08B** *21/00*
U.S. Cl. 340—51 **18 Claims**

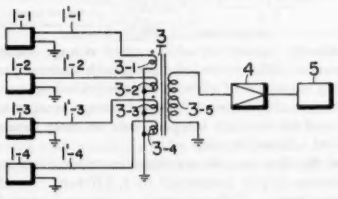


1. A parking compensator, comprising movable means adapted to be situated in the path of movement of a vehicle such as an automobile as the latter approaches an obstacle such as a wall, column, or the like, to be moved by the vehicle, signal means operatively connected with said movable means to be actuated thereby for providing a first signal when said movable means has been moved by the vehicle through a first increment and a second signal when the movable means has been moved by the vehicle through a second increment subsequent to said first increment, so that the operator of the vehicle can be warned by the first signal that the vehicle must be brought to a stop and can attempt to bring the vehicle to a stop in response to the second signal, and positioning means operatively connected with said movable means for positioning the latter with respect to the obstacle for possible movement into direct engagement with the obstacle while being at a distance therefrom which will enable the operator to locate the vehicle close to the obstacle while compensating for the distance through which the vehicle will necessarily continue to move after said signal means provides said second signal.

3,922,639
MULTIPLE INPUT SIGNAL DETECTING DEVICE

Yoichi Shimahara; Takashi Shimada, both of Takatsuki; Shigeki Kitamura, Hirakata; Hiroshi Miyanishi, and Hiroshi Senda, both of Neyagawa, all of Japan, assignors to Toyo Rubber Industry Co., Ltd. and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Aug. 27, 1974, Ser. No. 501,104
Claims priority, application Japan, Aug. 28, 1973, 48-96886; Aug. 28, 1973, 48-96887; Aug. 28, 1973, 48-96888; Aug. 28, 1973, 48-101514; Aug. 28, 1973, 48-101515
Int. Cl.² G08B *19/00*
U.S. Cl. 340—52 F **9 Claims**

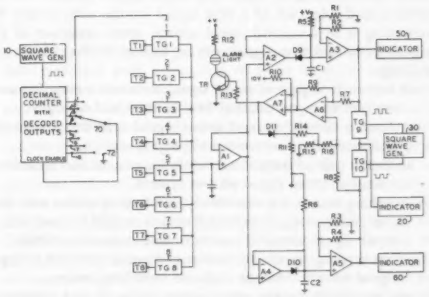


1. A device for detecting multiple input signals, which comprises a signal detecting circuit including a plurality of signal carrier lines for carrying a plurality of AC input signals changeable in electric characteristics such as levels, phases or frequencies upon occurrence of abnormality and a multi-input transformer having a plurality of primary windings connected to respective signal carrier lines and at least one secondary winding including an output secondary all the windings being wound around an iron core having a common magnetic circuit, and an output circuit for treating an output from said output secondary winding of the multi-input transformer; said primary windings in the signal detecting circuit being wound to magnetically cancel magnetic flux of said AC input signals when all of the signals are kept normal and connected between said signal carrier lines and said output circuits to produce an output at said output secondary winding upon breakage of the balance for magnetic cancellation when at least one of the AC input signals is in abnormality.

3,922,640
MAXIMUM AND MINIMUM BRAKE TEMPERATURE INDICATOR

Edgar J. Ruof, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Oct. 1, 1973, Ser. No. 402,155
Int. Cl.² G01K *13/02;* **G08B** *17/06*
U.S. Cl. 340—57 **8 Claims**



1. A device for use on a vehicle having a plurality of braking units for monitoring operating temperatures of the hottest and coolest brake units and a temperature difference therebetween, comprising:

first circuit means connected to the brake units for sensing the temperature of each of the brake units and producing output signals indicative thereof;

a first operational amplifier circuit connected to the first circuit means and including a first capacitor, said first capacitor being charged to produce an output signal indicative of the temperature of the coolest brake unit;

a second operational amplifier circuit connected to the first circuit means and including a second capacitor, said second capacitor being charged to produce an output signal indicative of the temperature of the hottest brake units;

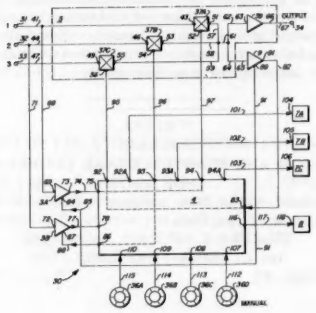
second circuit means connected to the first and second operational amplifier circuits for producing a signal when the temperature difference between the hottest and coolest brake units exceeds a predetermined amount; and

a single indicator connected to and mutually exclusively monitoring the outputs of both the first and second operational amplifier circuits on a time-sharing basis, and producing a visual indicia of said outputs.

3,922,641
AUTOMATIC VIDEO AND AUDIO SOURCE SELECTOR FOR ENTERTAINMENT CENTER

William A. Gates, Jr., 3228 E. Delcoa Drive, Phoenix, Ariz. 85032

Filed Dec. 11, 1974, Ser. No. 531,620
Int. Cl.[2] H04Q *3/00*; H03K *17/00*
U.S. Cl. 340—147 LP 13 Claims



1. An automatic electronic control system for an entertainment system utilizing video and audio signal sensors for the preferential selection of a first signal source with means for returning it to a second signal source upon cessation of the signal from said first signal source, said control system comprising:

at least a first pair of input signal terminal means for connection to a preferential first multi-signal source,

at least a second pair of input signal terminal means for connection to a second multi-signal source,

at least a pair of output terminals for connection to at least a dual channel signal output system,

switching means for selectively connecting either said first pair of input signal terminal means or said second pair of input signal terminal means to said output terminals,

a first sensing circuit interconnecting said first pair of input signal terminal means and said switching means,

said switching means upon energization of said automatic electronic control system connecting said second pair of input signal terminal means to said output terminals,

said first sensing circuit upon sensing a signal at said first pair of input signal terminal means generating a control signal to actuate said switching means to connect said first pair of input signal terminal means to said output terminals,

said switching means being actuated to reconnect said second pair of signal terminal means to said output terminals upon termination of said signal from said first sensing circuit.

3,922,642
AUTOMATIC SPINNING SYSTEM

Takuzo Tooka, Aichi, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

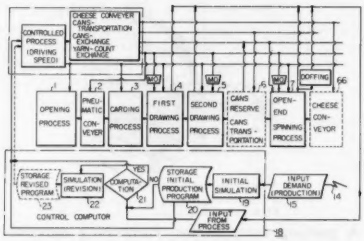
Continuation-in-part of Ser. No. 146,659, May 25, 1971. This application Oct. 19, 1973, Ser. No. 408,009
Claims priority, application Japan, May 26, 1970, 45-44703; May 26, 1970, 45-44704; May 26, 1970, 45-44705; May 26, 1970, 45-44706
Int. Cl.[2] G05B *15/02*; G06F *9/12*
U.S. Cl. 340—172.5 2 Claims

1. An automatic process control system for carrying out a spinning operation comprising:

a. a plurality of opening machines (1A, 1B, 1C) for manufacturing cotton tufts;

b. a plurality of carding machines (31A, 31B, 31C) for manufacturing card slivers from said cotton tufts, each of which is selectively connected to one of said opening machines (1A, 1B, 1C) through a distributor (2) and reserve boxes (3A, 3B, 3C);

c. a plurality of first drawing frames (4A, 4B, 4C) connected to said carding machines (31A, 31B, 31C) through a conveyer belt, for manufacturing the first drawing slivers packaged in cans from said card slivers;



d. a plurality of second drawing frames (5A, 5B, 5C) for manufacturing second drawing slivers packaged in cans, from said first drawing slivers in cans;

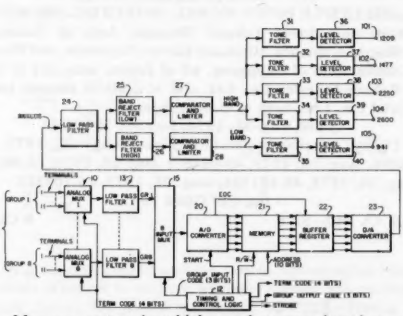
e. a plurality of open-end spinning frames (7) connected to said second drawing frames through conveyers, and;

f. control means for controlling the operational speed of all said machines and frames and driving all said conveyers wherein said control means compares actual accumulative amount of production of each process with desired accumulative amount of production at predetermined time and revises said operational speed according to the result of said comparison.

3,922,643
MEMORY AND MEMORY ADDRESSING SYSTEM

Margaret A. Poole, Wayland, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 4, 1974, Ser. No. 502,934
Int. Cl. G11C *7/00*
U.S. Cl. 340—172.5 5 Claims



1. Memory system in which word storage locations are addressed in different order during each address period in a recurring sequence of address periods including

memory means having 2^{N+M} word storage locations, wherein N and M are each integers, said memory means having N+M address inputs;

N+M flip-flop means arranged in order each having an address output connected to a different one of the address inputs of the memory means and each having a clock input connection;

each flip-flop means having an output connection coupled to the clock input connection of the next flip-flop means

in the order, with the output connection of the last flip-flop means in the order being coupled to the clock input connection of the first flip-flop means in the order;

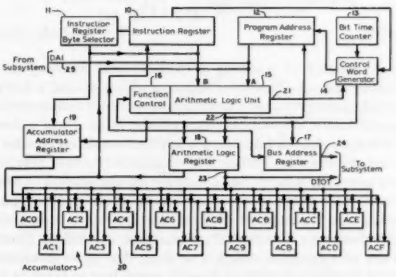
a source of periodic clock pulses;

a plurality of gating means each being connected between said source of periodic clock pulses and the clock input connection of a different one of said flip-flop means; and control means for activating each of said gating means in a recurring sequence to permit the passage of clock pulses therethrough to its associated flip-flop means, each gating means being activated for an address period of 2^{N+M} clock pulses, whereby the word storage locations are addressed in a different order during each address period of a recurring sequence of address periods.

3,922,644
SCAN OPERATION FOR A CENTRAL PROCESSOR

Robert A. Borbas; John P. Dufton, both of Brockville, and James H. Foster, Smithsfalls, all of Canada, assignors to GTE Automatic Electric (Canada) Limited, Brockville, Canada

Filed Sept. 27, 1974, Ser. No. 510,253
Int. Cl.² G06F 9/06
U.S. Cl. 340—172.5 **16 Claims**



1. In a central processor of the type which controls the operation of telephone exchange subsystems to establish requested service between telephone subscribers in response to a plurality of addressable multiple bit operational codes, wherein each of the subsystems is connected to the central processor by a common data bus and assigned a discrete subsystem address for enabling the addressing of each subsystem and wherein one of the subsystems is a program memory containing the plurality of operational codes, the improvement of scan means responsive to a particular operational code which includes a first partial subsystem address for interrogating preselected subsystems to locate stored subsystem data which contains preselected bits of data comprising:

an instruction register for storing the particular operational code;

an instruction register byte selector coupled to said instruction register for selecting said first partial subsystem address;

a first accumulator for storing a second partial subsystem address;

combining means coupled to said instruction register byte selector and said first accumulator for combining said first and second partial subsystem addresses to provide a composite subsystem address;

a bus address register coupled to said combining means and to said common data bus for addressing the subsystem having said composite subsystem address for causing it to transmit the data stored therein over said common data bus;

a second accumulator for storing the preselected bits of data as a compare constant;

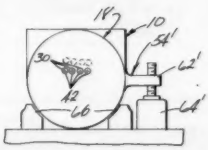
a comparator coupled to said common data bus and to said second accumulator for comparing said transmitted data to said compare constant for determining if said transmitted data and said compare constant are identical; and

means responsive to said comparator for providing a first control signal when said transmitted data and said compare constant are identical and for providing a second control signal when said transmitted data and said compare constant are not identical.

3,922,645
DATA HANDLING SYSTEM WITH ROTATABLE FIBER OPTIC SHUTTER

Harold E. Camp, Toledo, Ohio, and John D. Grier, Bridgeton, N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 574, Jan. 5, 1970, Pat. No. 3,749,487. This application Mar. 12, 1973, Ser. No. 340,212
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² G11C *11/28*; **H01L** *31/14*; **H05B** *41/00*
U.S. Cl. 340—173 PL **8 Claims**



5. In combination, a gas discharge panel having a print-out face provided with a plurality of fixed locations selectively energizable so as to become illuminated to present an illuminated pattern of desired information, print-out means having a surface sensitive to illumination and operative to make a record of an illuminated pattern on said print-out face, print-through means interposed between said print-out face and said illumination sensitive surface and including a matrix of coherently arranged light conducting elements, each having an input end thereof positioned to register with one of said fixed locations on said print-out face and an output end thereof positioned adjacent said illumination sensitive surface of the print-out means, so as to transfer the illuminated pattern to the print-out means, the print-through means also including turn-off means for predeterminately alternately interrupting and initiating the transfer of illumination by the print-through means, the turn-off means including means to rotate said print-through means about an axis parallel to said light conducting elements between a position where the input ends of all said light conducting elements register with said fixed locations on said print-out face and another position where said input ends of all said light conducting elements are out of register with said fixed locations on said print-out face, whereby the transfer of illumination may be interrupted.

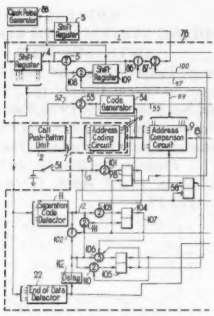
3,922,646
REPERTORY DIALLER WITH VARIABLE LENGTH CIRCULATING STORE

John David Emrys Beynon; Alan Francis Newell; Robert John Maddock, all of Southampton, and Robert Andrew Stevenson, Newton Aycliffe, England, assignors to The General Electric Company Limited, London, England

Filed Mar. 27, 1974, Ser. No. 455,342
Claims priority, application United Kingdom, Mar. 29, 1973, 15121/73
Int. Cl.² G11C *19/00, 21/00*
U.S. Cl. 340—173 RC **9 Claims**

1. A digital storage system for storing data in the form of a plurality of data words of variable length comprising a dynamic data store having a circulation loop round which the stored data words normally pass repeatedly as a single block

of data without any gaps between words in the block, circuit means to add a data word to the end of the block of data circulating round the loop, erasure means temporarily to interrupt said loop to erase a data word stored by said store, and close-up means responsive to operation of the erasure



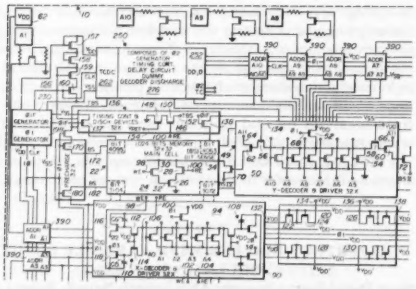
means to leave a gap in the block of data circulating round the loop temporarily to produce a predetermined variation in the effective length of the loop for a period less than that in which said block of data passes round the loop during each of the succession of passes so as to reduce the gap during each such pass until the gap has closed up.

3,922,647

EXTERNAL EXCLUSIVE OR TYPE CIRCUIT FOR INVERTING CELL MOS RAM

Bernard D. Broeker, Jr., Gilbert, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,557
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **7 Claims**



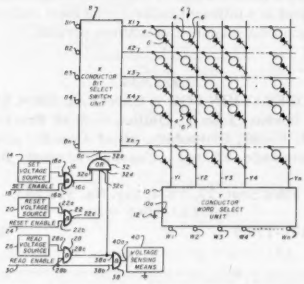
1. In a semiconductor random access memory including an MOS chip having an array of inverting storage cells and a plurality of data control cells coupled to said array, a data control conductor, said data control cells being coupled to said data control conductor, a bit sense conductor, a plurality of said array of inverting storage cells being coupled to said bit sense conductor, said semiconductor random access memory comprising external Exlusive OR-type circuit means coupled to said bit sense line and said data control conductor for producing an output data signal by comparing a first signal coupled from said data control conductor and a second signal coupled from said bit sense line.

3,922,648

METHOD AND MEANS FOR PREVENTING DEGRADATION OF THRESHOLD VOLTAGE OF FILAMENT-FORMING MEMORY SEMICONDUCTOR DEVICE

William D. Buckley, Troy, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 19, 1974, Ser. No. 498,299
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **18 Claims**



1. A method of resetting a filament-type memory device including spaced electrodes between which extend a body of generally amorphous non-conductive memory semiconductor material which, when a set voltage pulse in excess of a threshold voltage value and duration is applied to said electrodes has formed therein a crystalline low resistance filament resettable into a generally amorphous condition by application of one or more reset voltage pulses producing reset current pulses through said filament which heat the same to a temperature which dissipates substantially the entire crystalline filament and are of a duration which is so short that upon termination thereof the filament will be quickly quenched to leave at least portions of the filament in a substantially amorphous condition, said memory semiconductor material being such that immediately after each reset current pulse flows through the previously set filamentous path the threshold voltage value thereof drops to a minimum temporary threshold voltage value and gradually rises to a stabilized threshold voltage value over a recovery period, said method comprising: applying to said electrodes a burst of reset voltage pulses spaced apart a fractional part of said recovery period and each of a value in excess of the temporary threshold voltage value, so reset current pulses are produced thereby each of which at least partially converts the crystalline filamentous path into a substantially amorphous condition.

3,922,649

WATCHMAN'S TOUR RECORDING SYSTEM

Richard J. Thome, Cranford, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sept. 10, 1974, Ser. No. 504,765
Int. Cl.² G11C *13/00*
U.S. Cl. 340—173 R **24 Claims**

1. A watchman's unit for recording the checking of stations by a watchman, said unit comprising,

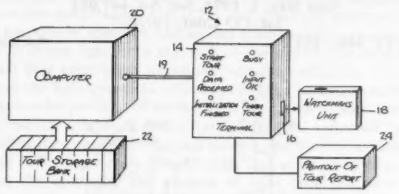
memory means having a plurality of locations therein for storing signals applied thereto,

clock means for generating time signals corresponding to elapsed time following an applied reset signal,

station detector means for producing station signals corresponding to the identity of a station upon connection of the unit to a station being checked, and

address means operative in response to the production of station signals to direct the time signals being generated to a particular location in said memory means,

whereby each location in said memory means which receives a time signal corresponds to the particular station



which was being checked during the occurence of said time signal.

3,922,650

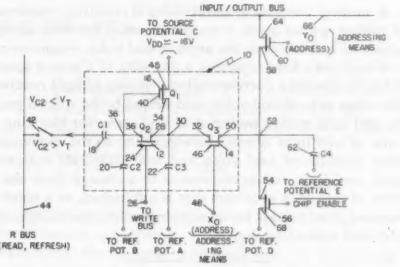
SWITCHED CAPACITOR NON-VOLATILE MNOS RANDOM ACCESS MEMORY CELL

Albert M. Schaffer, Kettering, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 11, 1974, Ser. No. 522,663

Int. Cl.[2] G11C *11/24, 11/40*

U.S. Cl. 340—173 CA **9 Claims**



1. An MOS random-access integrated circuit memory cell which utilizes at least separate read-refresh, input-output, write, and addressing lines comprising:

a two terminal switched capacitor adapted for storing an electrical charge, having one of its terminals coupled to the read-refresh line;

a first alterable threshold MOS device having a gate coupled to the write line and at least two other electrodes, one of the other electrodes coupled to the other terminal of the switched capacitor, the other electrode coupled to a common junction;

a first storage capacitor coupled between a first source of reference potential and the common junction;

a second MOS device having a gate coupled to the other terminal of the switched capacitor and at least two other electrodes, one of the other electrodes coupled to the common junction, the other electrode coupled to a source of operating potential;

a third MOS device having a gate coupled to the addressing line and at least two other electrodes, one of the other electrodes coupled to the common junction, the other electrode coupled to the input-output line; and

a second storage capacitor coupled between a second source of reference potential and the other terminal of the switched capacitor to allow the switched capacitor to couple the read-refresh line to the first MOS device during intervals the second capacitor is charged above a given value and to allow the switched capacitor to disconnect the read-refresh line from the first MOS device during intervals the second capacitor is charged below the given value.

3,922,651

MEMORY DEVICE USING FERROMAGNETIC SUBSTANCE LINES

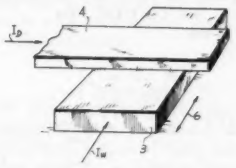
Nobutake Imamura, Tokyo, and Toshihiko Kobayashi, Mitaka, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Oct. 25, 1973, Ser. No. 409,743

Claims priority, application Japan, Oct. 26, 1972, 47-106685

Int. Cl.[2] G11C *11/14*

U.S. Cl. 340—174 TF **6 Claims**



1. A word-selection memory device using a ferromagnetic substance, comprising:

a plurality of nonmagnetic lines of rectangular section arranged in parallel to one another; and

a plurality of memory lines of rectangular section orthogonally arranged with respect to said nonmagnetic lines and composed only from a conducting, ferromagnetic substance having an axial easy magnetization axis, the thickness of each of said memory lines being within a range of **5000A** to **2** microns.

3,922,652

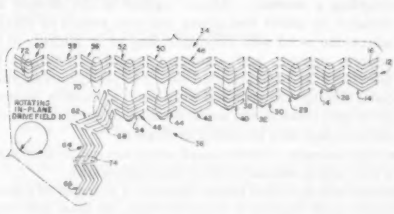
FIELD-ACCESSED MAGNETIC BUBBLE REPLICATOR

Robert Melvin Sandfort, St. Charles, and Paul Townsend Bailey, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 22, 1974, Ser. No. 453,783

Int. Cl.[2] G11C *11/14, 19/08*

U.S. Cl. 340—174 TF **6 Claims**



1. A field-accessed bubble splitting system, comprising a sheet of magnetic bubble material, means for producing and maintaining magnetic bubbles therein, means for generating a rotating magnetic drive field in the plane of said sheet, and a ferromagnetic circuit overlay pattern operatively disposed on said sheet defining an input channel and a pair of diverging channels defining consecutive bubbles positions through which bubbles are propagated by said drive field, said diverging channels being joined together to said input channel so as to gradually diverge therefrom, the angle of divergence of said diverging channels being sufficiently small to maintain a bubble propagated from said input channel stretched across said diverging channels for several consecutive bubble positions, one of said diverging channels having an abrupt turn away from the other of said diverging channels, the distance from

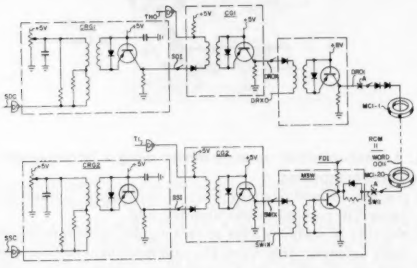
the junction of said diverging channels with said input channel to the abrupt turn in said one diverging channel corresponding to several complete rotations of said drive field, said distance from said junction to said abrupt turn being predetermined such that by the time a stretched bubble arrives at said turn its limit of stretch has not yet been exceeded and it is thus severed at the turn into two bubbles which propagate on down said diverging channels respectively.

3,922,653

RING CORE MEMORY ARRANGEMENT

John T. Lighthall, and David M. Shaver, both of Brockville, Canada, assignors to GTE Automatic Electric (Canada) Limited, Brockville, Canada

Filed Aug. 16, 1974, Ser. No. 498,145
Int. Cl.² G11C *5/04*
U.S. Cl. 340—174 DA **11 Claims**



1. A memory arrangement comprising a plurality of ring-shaped magnetic cores with an individual sense winding on each core, word wires selectively threaded through the inside of some of said cores and outside of others to thereby store information;

memory input means comprising a plurality of memory drivers each having an output connected to a driver terminal, a plurality of memory switches each having an output connected to a switch terminal, each of said word wires connected in series with diode means between a driver terminal and a switch terminal, selection means coupling a memory address register to the drivers and switches to select one driver and one switch to thereby select one word wire corresponding to an address in the address register, and actuation means to energize the selected driver and selected switch to pass a current ramp pulse through the selected word wire, to thereby generate an output pulse in the sense winding of each core having the selected wire threaded through it;

the improvement wherein saiad actuation means comprises a first and a second current ramp generator,

wherein said selection means includes a plurality of current gates, each having a current input, at least one logic input, an output, and circuit elements interconnecting its inputs and output so that responsive to all of its logic inputs being enabled and a current ramp pulse being supplied to the current input a current ramp pulse is produced at its output having substantially the same shape as the pulse at its current input;

where in each of said drivers and each of said switches is one of said current gates, each driver having its current input coupled to the first current ramp generator and each switch having its current input coupled to the second current ramp generator, the logic inputs being coupled to the address generator;

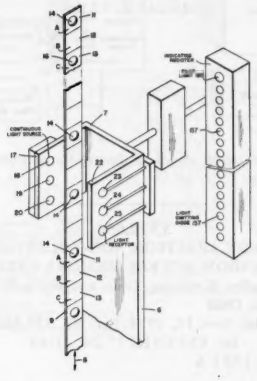
and the actuation means further includes means to actuate said current ramp generators so that the current pulse is steered between them via the selected driver and selected switch through the selected word wire.

3,922,654

MOTION TRANSDUCER AND INDICATOR

Howard C. Hobson, Jr., San Francisco, Calif., assignor to Rucker Control Systems, Oakland, Calif.

Filed Mar. 1, 1974, Ser. No. 447,081
Int. Cl.² G08C *19/16*
U.S. Cl. 340—201 P **9 Claims**



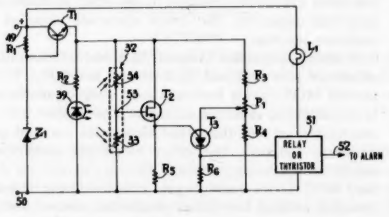
1. A motion transducer comprising a relatively stationary yoke having spaced arms, a rectilinear strap movable along a longitudinal axis between the arms of said yoke, means on one arm of said yoke for projecting a plurality of discrete spaced light beams toward a corresponding plurality of light receivers on the other arm of said yoke, said beams being spaced parallel to said axis, means included in said strap for blocking all but one of said light beams corresponding to the momentary relative position of said yoke and said strap, an indicating register, and logic means responsive to a change from one to another of said light receivers that is unblocked, as a result of movement of said strap, for controlling a corresponding actuation of said indicating register.

3,922,655

SMOKE OR FIRE DETECTOR

Daniel Lecuyer, Le Pecq, France, assignor to La Detection Electronique Francaise Protecbat, Vanves, France

Filed Mar. 6, 1973, Ser. No. 338,480
Claims priority, application France, Mar. 7, 1972, 72.07812; May 26, 1972, 72.19006
Int. Cl.² G08B *21/00*
U.S. Cl. 340—237 S **9 Claims**



1. An optical smoke or fire detector comprising a cylindrical container, having a support plate attached to and extending across said container, a photosensitive cell having a housing mounted on said support plate, and first and second photosensitive elements mounted within said housing, said first photosensitive element connected to a first output thereof and said second photosensitive element connected to a second

output thereof, each photosensitive lement having a signal output, the photosensitive cell being located in the container which is impervious to exterior light but which includes means allowing entry of smoke; a light source located in the container and oriented to radiate light in a direction perpendicular to the longitudinal axis of the container and perpendicular to the axes of said first and second photosensitive elements so as to direct light onto the wall of the cylindrical container; such that upon entry of smoke into the container, the light from the light source is reflected onto the first photosensitive element by particles of smoke, reflecting means located in said cylindrical container to further reflect light reflected by the wall of the container onto said second photosensitive element, said reflecting means located such that upon entry of smoke into the container the amount of light reflected onto said second photosensitive element is decreased; and electrical circuit means connected to the outputs of said cell for differentially associating the signals furnished by the photosensitive elements so as to be able to trigger an alarm signal, said light source being a solid state component.

3,922,656

SENSING PRESENCE OF FIRE

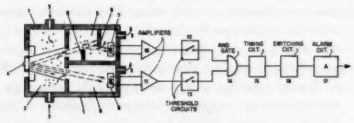
Zoltan Horvath, Zurich, and Gustav Purt, Rapperswil, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed Nov. 15, 1973, Ser. No. 416,231

Claims priority, application Switzerland, Dec. 6, 1972, 17783/72

Int. Cl.² G08B *21/00*

U.S. Cl. 340—237 S **18 Claims**



1. Method to indicate presence of fire by testing an atmospheric sample comprising

irradiating the sample with radiation by irradiating the sample by radiation in a spectral range in which the gaseous combustion products have absorption bands;

sensing the spectral absorption characteristics of the irradiated sample to test for absorption within said bands and hence gaseous combustion products and deriving a gas analysis signal;

sensing dispersion of irradiating radiation to test for dispersed particles in the atmospheric sample and delivering a particle signal;

detecting coincidence of the gas analysis signal and the particle signal;

and providing an output signal if and only if coincidence is detected.

3,922,657

LOW LIQUID LEVEL WARNING DEVICE

Yoshihiro Hayashida, Chigasaki, and Hiroyuki Suzuki, Kawasaki, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

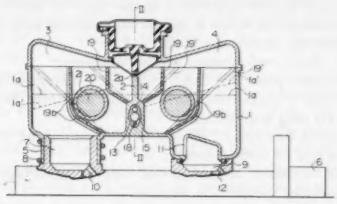
Filed Dec. 18, 1974, Ser. No. 533,750

Claims priority, application Japan, Dec. 20, 1973, 48-3428

Int. Cl.² G08B *21/00*

U.S. Cl. 340—244 E **6 Claims**

1. A low liquid level warning device for use in a brake liquid reservoir supplying a tandem master cylinder or the like in a vehicle hydraulic braking system, said device comprises a lead switch disposed in the bottom portion of a partition wall dividing the interior of the reservoir into two chambers, a float disposed in each of said chambers and having a magnet thereon for actuating said lead switch, a guide disposed in each of the chambers for guiding the corresponding float, at least a portion of each guide extends from the bottom portion



of the partition wall upwardly towards the center portion of each chamber in a declined manner, and a warning circuit connected to said lead switch.

3,922,658

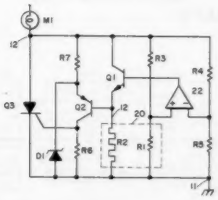
FLUID LEVEL MONITOR

Patrick D. Harper, Seaford; Theodore L. Knight, Newport News; Michael Slavin, Gloucester Point, and Ward A. Ingels, Newport News, all of Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 4, 1974, Ser. No. 529,425

Int. Cl.² G08B *21/00*

U.S. Cl. 340—244 R **15 Claims**



1. A fluid level monitor constructed in accordance with thick film techniques for monitoring the level of a fluid within a container, comprising:

a substrate;

first and second electrical terminals;

an electrical latch;

first and second thermistors connected in series across said first and second terminals, said first thermistor being disposed on said substrate and said second thermistor being disposed on said substrate remote from said first thermistor;

electrical means connected between said first and second terminals including heater means having at least a first portion thereof disposed in relatively close proximity to said first thermistor and adapted to heat said first thermistor, said first and second thermistors being connected with said electrical means into an electrical bridge configuration having interior points, said electrical latch being responsive to the voltage across said interior points to close said latch;

means for supporting and positioning said substrate within said container with said first thermistor close to the level of the fluid so that at least one of said first thermistors and said first portion of said heater is in thermal contact with the fluid when the level thereof is high whereby the voltage across said interior points is of a first value, and said first thermistor and said first portion of heat heater are out of thermal contact with the fluid when the level thereof is low whereby the voltage across said interior points is of a second value;

a source of a first electrical voltage impressed across said first and second terminals;
a source of a second electrical voltage; and,
indicator means responsive to the state of said latch and connected in series with said latch across said source of a second electrical voltage.

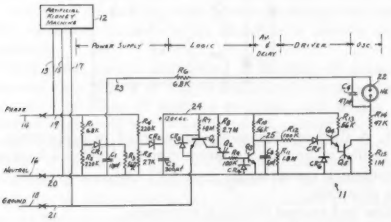
10. A fluid level monitor probe comprising:
a thin, flat, plate like electrically non-conductive substrate having a supporting surface, said substrate being relatively long and narrow;
at least a first heater affixed to said supporting surface at one end of said substrate;
a first thermistor affixed to said supporting surface in close proximity to said first heater;
a second thermistor affixed to said supporting surface at an opposite end of said substrate, said substrate being adapted for cooperation with a fluid whose level is to be monitored so that at least a portion of said one end is immersed in said fluid and said opposite end is out of said fluid; and,
electrically conductive tracks affixed to said supporting surface and adapted to provide electrical communication between said first and second thermistors and said heater.

3,922,659

POWER LINE FAULT INDICATING SYSTEM EMPLOYING A NEON LAMP OSCILLATOR

Kamalakar D. Dighe, Laurel, Md., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed July 29, 1974, Ser. No. 492,657
Int. Cl.[2] G01R *31/02*
U.S. Cl. 340—253 Q **13 Claims**



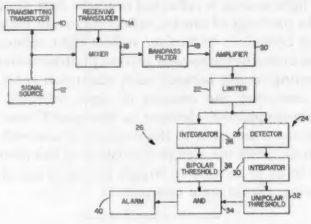
1. An a.c. power line fault indicating device comprising respective phase, neutral and ground conductors, an indicator circuit branch including a capacitor and a resistor connected in series and a discharge lamp connected across the capacitor to form an oscillator, circuit means including a rectifier connecting said indicator circuit branch across said phase and neutral conductors, switch means connected across said resistor, means to close said switch means to disable the oscillator when said phase, neutral and ground conductors are connected to corresponding supply terminals of a three-wire a.c. power supply system free of wiring faults, whereby to illuminate said discharge lamp steadily, and means opening said switch means responsive to the presence of a wiring fault condition in the power supply system, whereby to allow the oscillator to function and to cause periodic illumination of said discharge lamp, wherein the switch means comprises an electrically operated switch device and the means responsive to the presence of a wiring fault condition comprises a wiring fault-sensitive control circuit operatively connected between said ground conductor and said electrically operated switch device.

3,922,660

VOLUMETRIC INTRUSION ALARM USING BOTH DOPPLER AND NET-CHANGE SIGNAL PROCESSING

Aaron A. Galvin, Lexington, Mass., assignor to American District Telegraph Company, New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,063
Int. Cl.[2] G08B *13/24*
U.S. Cl. 340—258 A **7 Claims**



1. An intrusion alarm system for detecting a target in ghe presence of interfering phenomena, said system comprising:
means for transmitting signals into a zone under surveillance;
means for receiving signals returned from the surveillance zone;
positional characteristic sensing means including:
means operative in response to said received signals for providing a signal representing change in positional characteristics of objects in the zone;
means establishing a reference threshold in accordance with the static positional characteristics of the zone and stationary objects therein;
means for comparing said positional reference threshold with said positional signal to provide a change of position indication signal upon exceedance of said positional reference signal by said positional signal;
Doppler characteristic sensing means including:
means operative in response to said received signals for providing a signal representing the Doppler characteristics of objects in the zone;
means establishing a reference threshold in accordance with the Doppler characteristics of the zone and objects therein;
means for comparing said Doppler reference threshold with said Doppler signal to provide a motion indication signal upon exceedance of said Doppler reference threshold by said Doppler signal; and
means for producing an alarm only upon the simultaneous occurrence of said motion indication signal and said change of position indication signal.

3,922,661

CONVEYOR BELT PROTECTION CONTROL AND INDICATING SYSTEM

Robert S. Enabnit, Akron, and Kenneth A. Spriggel, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

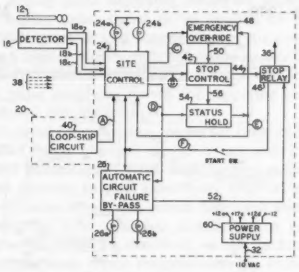
Filed Dec. 28, 1973, Ser. No. 429,456
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—259 **15 Claims**

1. In combination with an endless belt conveyor having a drive means responsive to on/off control signals, an electronic control system for monitoring the operating condition of the belt comprising:
1. sensor means associated and movable with the belt and adapted to be open-circuited upon the occurrence of damage to the belt;
2. a detector circuit mounted in fixed relative position to the belt and responsive to the proximate passage of the sensor means to provide a periodic pulse output signal indicative

of the close-circuited condition of the sensor means; and

3. a master control unit comprising:

A. a site control circuit coupled to the detector circuit output and responsive to the presence or absence of pulses from the detector circuit to condition the pulse signal to a threshold level indicative of a preselected pulse period established for successive close-circuited sensors and to compare the threshold to a preselected reference level;



B. a stop relay coupled to the conveyor drive means to control the state of the drive means according to its energization; and

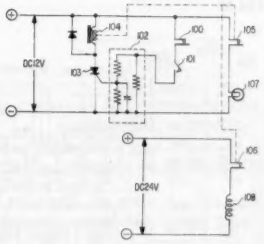
C. a stop control circuit intercoupling the site control and stop relay circuits to monitor circuit operations and to determine the validity of all site control output signals, said stop control circuit providing on/off control signals to the stop relay circuit to de-energize the relay only when the conditions for validity are met and the threshold as established in the site control exceeds the reference and to maintain the relay energized under all other validity/threshold condition combinations.

3,922,662

DETECTOR FOR USE WITH A DUPLICATOR OR THE LIKE FOR DETECTING INCORRECTLY ALIGNED DOCUMENTS

Toshio Hiratsuka, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 2, 1974, Ser. No. 466,452
Claims priority, application Japan, May 18, 1973, 48-54729
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—259 **2 Claims**



1. In a duplicator or the like having a document transport device including a plurality of grippers for the transported documents, the improvement of detecting documents incorrectly aligned with respect to the document feed device, said improvement comprising

at least one of said grippers including an electrically conductive path extending from a first gripping member of said one gripper to the second gripping member thereof when said gripper is closed without a document therein;

alarm means connected across said first and second gripping members for producing an alarm signal whenever said electrically conductive path is closed; and

means for normally holding said grippers apart and closing said grippers when a document is fed to the transport device;

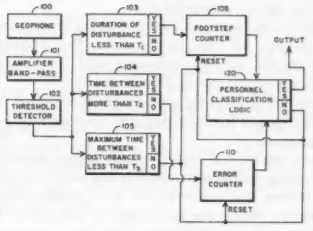
said alarm means being inhibited whenever a fed document is correctly aligned with respect to the transport device since the electrically insulative nature of the document prevents said electrically conductive path from being closed when said one gripper is closed and said alarm means being actuated whenever said document is incorrectly aligned with respect to the transport device since said one gripper closes without said document being gripped thereby to thereby close said electrically conductive path.

3,922,663

SEISMIC HUMAN FOOTSTEP DETECTOR

Roger A. Lubke, Excelsior, and Charles P. Varecka, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 30, 1974, Ser. No. 474,753
Int. Cl.[2] G08B *13/22*
U.S. Cl. 340—261 **4 Claims**



1. A seismic apparatus for detecting and identifying seismic disturbances caused by human footsteps, said apparatus comprising:

a seismic sensor for detecting seismic disturbances, and for providing at its output electrical pulses corresponding to said seismic disturbances;

a first timing means for receiving said pulses from said seismic sensor and providing a signal at its output whenever the duration of a pulse does not exceed a first predetermined time period;

a second timing means for receiving said pulses from said seismic sensor and providing a signal at its output whenever the time separation between successive pulses does not exceed a second predetermined time period;

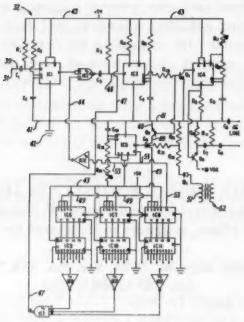
a third timing means for receiving said pulses from said seismic sensor and providing a signal at its output whenever the time separation between successive pulses is greater than a third predetermined time period; and

signal processing means for receiving signals from said first, second, and third timing means, and, in response thereto, providing at its output a signal representing a valid footstep.

3,922,664
DIGITAL COMMUNICATION SYSTEM WHICH CAN BE UTILIZED AS A SECURITY SYSTEM FOR APARTMENT HOUSES OR THE LIKE

Carl D. Wadsworth, P.O. Box 637, West Sacramento, Calif.

Filed May 28, 1974, Ser. No. 473,996
Int. Cl.[2] G08B 1/08, 13/00
U.S. Cl. 340—276 4 Claims



1. A digital communication system having at least one transmitting station and at least one receiving station connected by a common power line operating at a given frequency, said transmitting station comprising:

a. a first oscillator capable of producing a wave form having a frequency the same as the power line frequency;

b. first means for synchronizing said first oscillator frequency with the power line frequency;

c. means for generating a predetermined signal frequency;

d. trigger means for initiating the operation of said generating means;

e. means interposed between said trigger means and said generating means and connected to said first oscillator for controlling the initiation of said predetermined signal frequency during the first negative half cycle of said first oscillator after said trigger means has been activated;

f. means connected to said generating means and the common power line for applying said predetermined signal frequency to the common power line;

g. means for counting the number of negative going transitions of said first oscillator after said predetermined signal frequency has been applied to the common power line; and,

h. means connected to said counting means and said generating means for selectively terminating the application of said predetermined signal frequency to the common power line after a predetermined number of negative going transitions of said first oscillator has occurred;

said receiving station comprising:

i. a second oscillator capable of producing a wave form having a frequency the same as the power line frequency;

j. second means for synchronizing said second oscillator frequency with the power line frequency;

k. means for detecting said predetermined signal frequency applied to the common power line;

l. means connected to said frequency detecting means and said second oscillator for producing a single output pulse for every negative going transition of said second oscillator so long as said predetermined signal frequency is detected;

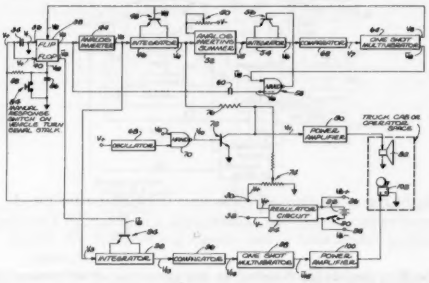
m. means for counting the total number of said output pulses; and,

n. indicia means for relating the total number of said output pulses to the identity of the transmitting station.

3,922,665
APPARATUS AND METHOD FOR MAINTAINING OPERATOR ALERTNESS

Renwick E. Curry, Hingham, and David Sheena, Randolph, both of Mass., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Oct. 4, 1974, Ser. No. 511,964
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—279 15 Claims



1. An apparatus for intermittently detecting operator alertness and altering stimuli in response to the detected degree of operator alertness, comprising:

means for initiating successive intermittent first stimuli detectable by the operator;

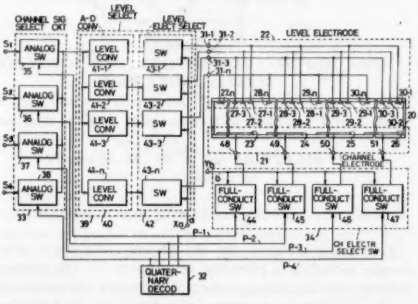
response means actuated by the operator upon detection of each such first stimulus; and,

detection means responsive to the initiation of each stimulus and the actuation of said response means for selectively modifying subsequent stimuli in inverse proportion to the operator alertness indicated by the detected actuation of the response means by the operator.

3,922,666
SIGNAL LEVEL DISPLAYING APPARATUS

Mamoru Inami; Yoshiaki Tanaka, and Tsuyoshi Ono, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Kanagawa, Japan

Filed Feb. 19, 1974, Ser. No. 443,658
Claims priority, application Japan, Feb. 19, 1973, 48-19946; May 1, 1973, 48-47596; May 15, 1973, 48-53195
Int. Cl.[2] G08B 5/36
U.S. Cl. 340—324 M 3 Claims



1. A signal level displaying apparatus comprising:

plasma display means having a plurality of channel electrode parts provided respectively for channels to be level-

displayed, a plurality of level electrode parts disposed respectively in correspondence to said channel electrode parts, a glass enclosure accommodating said channel electrode parts and said level electrode parts, and a gas mixture filled in said glass enclosure, each of said level electrode parts comprising a plurality of level electrodes disposed in order of the signal level of the corresponding channel;

first display pulse supplying means for supplying a first display pulse signal to be applied to the level electrode parts of said plasma display means;

second display pulse supplying means for supplying a second display pulse signal to be applied to the channel electrode parts of said plasma means, the polarity of the second display pulse signal being opposite to the polarity of the first display pulse signal;

control pulse supplying means for supplying control pulse signals for time division;

channel signal time division means for time-dividing a plurality of input channel signals in accordance with the control pulse signals from said control pulse supplying means thereby to pass selectively channel signals with time-division time zones which differ successively;

a plurality of level selection circuit means each having successively differing threshold values, each of said level selection circuit means responsive to the output signal of said channel signal time division means for producing a low voltage signal when the level of the output signal of said channel signal time division means is higher than its own threshold value and for producing a high voltage signal when the signal of the output signal of said channel signal time division means is lower than its own threshold value;

a plurality of level electrode selection circuit means respectively connected to the corresponding level selection circuit means, the outputs of said level electrode selection circuit means being respectively connected to the corresponding level electrodes of the level electrode parts, each of the level electrode selection circuit means supplying the first display pulse signal from said first display pulse supplying means to the corresponding level electrodes in response to said low voltage signal and suppressing the first display pulse signal in response to said high voltage signal; and

channel electrode selection means operating in accordance with the control pulse signals from said control pulse supplying means to time-divide the second display pulse signal from said second display supplying means in synchronism with said channel signal time division means and to supply the resulting time divided pulses with successively differing time division zones to all of said channel electrode parts of said plasma display means.

3,922,667

IMAGE OR SEGMENT PATTERN FORMING X-Y MATRIX ADDRESSING METHOD

Fumio Ueda, Nishinomiya, and Hirotsugu Arai, Takatsuki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1974, Ser. No. 453,066

Claims priority, application Japan, Mar. 27, 1973, 48-35221

Int. Cl.² G02F 1/18

U.S. Cl. 340—324 M **6 Claims**

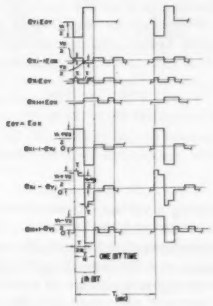
1. An X-Y matrix addressing method in which M numbers of electrodes X_1 through X_M are arranged in an X column, and N numbers of electrodes Y_1 through Y_N are arranged in a Y row, intersecting perpendicularly with the X-column electrodes, comprising the steps of:

applying scanning voltages e_{Y1} through e_{YN} to the N number of Y-row electrodes at a cycle T seconds;

applying signal voltages e_{X1} through e_{XM} to the M number of X-column electrodes;

applying a voltage $e_{Xi} - e_{Yj}$ to a matrix cell P_{ij} formed in the region where an arbitrary one X_i of the M number of X-column electrodes intersects with an arbitrary one Y_j of the N number of Y-row electrodes, in response to the timings of the bit state of the signal voltage and the bit state of the scanning voltage, thereby causing the X-Y matrix cells to exhibit a response in the form of an image or segment pattern; and,

determining the bit states of the scanning voltage e_{Yj} and of the signal voltage e_{Xi} so that the voltage e_{Yj} assumes the bit state 1 for the period of (T/N) seconds at the cycle T and the bit state 0 for the rest of the period T − (T/N)



seconds, and the voltage e_{Xi} assumes the bit state 1 or 0 according to the bit state matrix cell S_{ij} of an arbitrary signal, the scanning voltage e_{Yj} is $E_{OY} - (V_1/2)$ for the first half of the bit state 1 of the scanning voltage e_{Yj} and is $E_{OY} + (V_1/2)$ for the latter half of the bit state 1 where E_{OY} stands for an arbitrary potential value, and V_1 for a voltage with an arbitrary polarity and value, and further the scanning voltage e_{Yj} is E_{OY} for the period where the bit state of the scanning voltage e_{Yj} is 0, while, the signal voltage e_{Xi} is $E_{OX} + (V_2/2)$ for the first half of the bit state 1 of the signal voltage e_{Xi} and is $E_{OX} - (V_2/2)$ for the latter half of the bit state 1 where E_{OX} stands for an arbitrary potential value, and V_2 for a voltage with an arbitrary polarity and value.

3,922,668

LIQUID-CRYSTAL INDICATOR DRIVING SYSTEM

Juji Kishimoto, Tokyo, and Hiroyuki Mikada, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 281,265, Aug. 16, 1972. This application June 5, 1974, Ser. No. 476,676

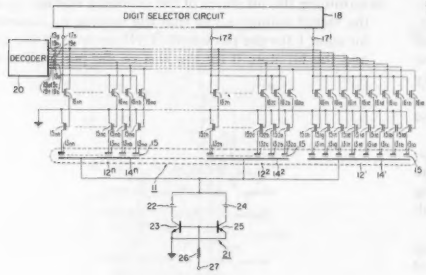
Int. Cl.² G02F 1/18

U.S. Cl. 340—336 **6 Claims**

1. In an electronic computer which includes signal entry means, means for executing an operation in response to a signal entry and means for controlling the operation of said executing means; the combination of

a liquid crystal indicator for displaying an information located in said computer, said liquid crystal indicator having at least one common electrode and a plurality of pattern electrodes opposed to said common electrode between which a liquid crystal material is interposed to carry out a displaying operation by applying a voltage between said common electrode and pattern electrodes; means for selecting said pattern electrodes including independent switch elements each connected in circuit with a different one of said pattern electrodes to control the application of voltage across said common electrode and pattern electrodes in response to application of switching signals to said switch elements, said switch

elements being arranged such that said switching signals are retained for a duration following application thereof whereby to maintain application of voltage across said electrodes; and a liquid crystal indicator driving system, comprising



means for applying a voltage of one polarity between said common electrode and the opposed pattern electrodes, which have been selected by said selecting means, while said computer is in a display indicating mode of its operation and for applying a voltage of a reverse polarity between said common electrode and the opposed pattern electrodes while said computer is in another mode of its operation.

3,922,669

TELEVISION SYSTEMS

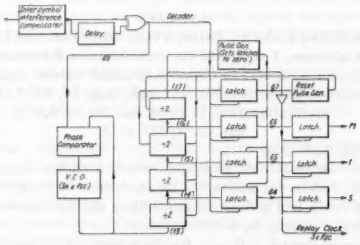
John Lewis Edwin Baldwin, Croydon, England, assignor to Independent Broadcasting Authority, London, England

Filed Aug. 22, 1973, Ser. No. 390,375

Claims priority, application United Kingdom, Aug. 24, 1972, 39606/72; Aug. 24, 1972, 39605/72

Int. Cl.² H04L *3/02*

U.S. Cl. 340—347 DD **7 Claims**



1. Apparatus for converting an original input signal of the kind which has a limited set of possible discrete values which comprises an input for said signal, apparatus for generating a cyclic reference signal providing in each cycle a set of values corresponding with the possible values of the input signal and at least one additional value, and a comparator responsive to produce a comparator output when the value of the reference signal corresponds with the value of the input signal, so that comparator outputs are obtained whose relationship to the phase of the reference signal represents the value of the original input signal.

3,922,670

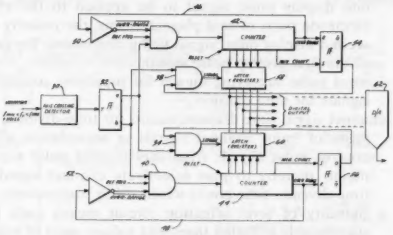
DIGITAL SYSTEM PROVIDING SIGNALS REPRESENTATIVE OF FREQUENCY VARIATIONS FROM A NOMINAL FREQUENCY

Benjamin Chandler Shaw, Granada Hills, and Rex John Crookshanks, Palos Verdes Estates, both of Calif., assignors to The Bendix Corporation, North Hollywood, Calif.

Continuation of Ser. No. 240,414, April 3, 1972, abandoned. This application Dec. 5, 1973, Ser. No. 421,886

Int. Cl.² H03K *13/00*

U.S. Cl. 340—347 R **6 Claims**



1. A system for sensing deviations in frequency of an unknown signal from a nominal frequency comprising

means applying said unknown signal to an axis crossing detector to provide an output signal for each complete period of said unknown signal,

first and second gate means receiving a reference frequency signal,

electrical switching means producing signals responsive to said output signal for alternately enabling said gate means to conduct said reference frequency signal for the period of alternate complete cycles of said unknown signal,

first and second counter means responsive to said gated reference signals for counting and storing the counts of said reference frequency signal for the period of alternate complete cycles of said unknown signal and means for resetting said counter means at the end of each said period,

third and fourth gate means responsive to the enabling signals from said electrical switching means and connected to said counter means such that when said first counter means is counting cycles of said reference signals said third gate means blocks the output of said first counter and said fourth gate means conducts the accumulated count of said second counter to an external utilization device and vice versa whereby a count is made representative of the length of each complete cycle of said unknown signal.

3,922,671

POSITION MEASUREMENT SYSTEM WITH PROVISION FOR CHANGE OF UNITS OF MEASUREMENT

Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.

Filed June 17, 1974, Ser. No. 480,442

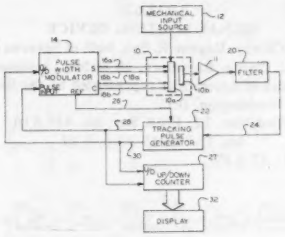
Int. Cl.² G08C *9/04*

U.S. Cl. 340—347 SY **6 Claims**

1. In a position measurement system having a position measurement transducer and means responsive to said transducer for generating a tracking pulse representative of a least change in the position of two relatively movable members of said transducer, further having a pulse-width modulator responsive to said tracking pulse for providing to said transducer an output pulse having a pulse-width proportional to said position, said modulator including a clock pulse source which provides clock pulses to first and second modulation counters of a type which stores a signal representation of a number which is increased in response to a clock pulse and provides

a modulator pulse concurrently with storing a signal representation of a predetermined maximum number, said modulation counters being connected to an output circuit which provides a sine output pulse having a pulse-width proportional to a time displacement between corresponding portions of said first and second modulator pulses, the improvement comprising:

positive accumulation means responsive to said tracking pulse for storing a signal representation of a positive base number which is changed in response to a tracking pulse,



said positive base number being representative of a cumulative change of said position; and

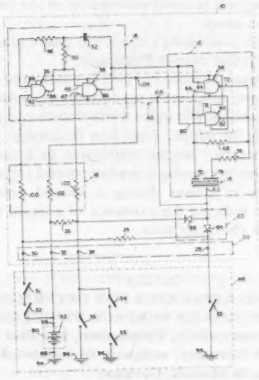
loading means responsive to said positive accumulation means for loading said first modulation counter to store in said first modulation counter said signal representation of a positive base number, whereby the pulse-width of said sine output pulse is altered by an amount proportional to said cumulative change of said position in a predetermined measurement system.

3,922,672

AUDIBLE ALARM DEVICE

Thomas W. Birt, Indianapolis; Louis P. Sweany, Carmel, and James D. Pirtle, Lawrence, all of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Mar. 4, 1974, Ser. No. 447,861
Int. Cl.² G08B 3/00
U.S. Cl. 340—384 E **9 Claims**



1. An audible alarm system comprising in combination.

a. an input-output terminal means for providing electrical terminations for attaching electrical circuits;

b. a transient protection circuit for protecting said audible alarm system against voltage transients and having an input side connected to said input-output terminal means, and an output side;

c. a tone generator circuit for producing an audible tone and having an input side and an output side including a piezoelectric transducer connected to said input-output terminal means; and

d. a pulsator circuit for producing pulsations in said audible tone comprising:

1. a first NAND gate section of a Quad two-input NAND gate integrated circuit package, a first input connected to said output side of said transient protection circuit, and a second input connected to one side of a first resistance means;

2. a second NAND gate section of a Quad two-input NAND gate integrated circuit package, a first input connected to said output side of said transient protection circuit, a second input connected to an output of said first NAND gate section and to a first side of a second resistance means, and an output of said second NAND gate section connected to said input side of said tone generator circuit and to a first side of a capacitance means; and

3. a second side of said first resistance means connected to a second side of said second resistance means and to a second side of said capacitance means

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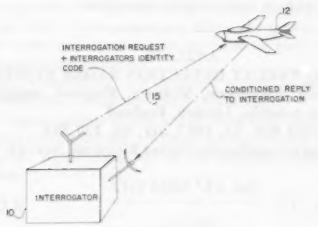
3,922,673

IFF INTERROGATOR IDENTIFICATION SYSTEM

Walton B. Bishop, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 31, 1974, Ser. No. 474,992
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 LC **7 Claims**



1. In a transponder having a shift register for receiving an interrogation signal and means for detecting the presence of mode-command pulses in said signal, the improvement comprising:

first coincidence means connected to said shift register for detecting the presence of an identity-code trigger pulse in said interrogation signal and for producing a first signal upon occurence of said detection;

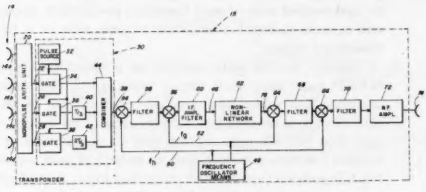
output means connected to said first coincidence means responsive to said first signal whereby an output signal will be present only upon occurence of said first signal;

second coincidence means connected to said shift register for detecting the presence of identity-code pulses in said interrogation signal and for producing output signals corresponding to the presence of said detected pulses.

3,922,674
TRANSPONDER FOR USE IN A RADIO FREQUENCY COMMUNICATION SYSTEM

Gerard J. Gingras, Jr., Chelmsford, and James T. Hanson, Maynard, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 24, 1974, Ser. No. 436,255
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.8 R **8 Claims**



1. In a radio frequency transponder wherein a received radio frequency signal is linearly amplified and then retransmitted as a radio frequency signal, such transponder including first heterodyning means for converting the received radio frequency signal to a corresponding intermediate frequency signal; nonlinear means responsive to the amplitude of the intermediate frequency signal, for distorting such intermediate frequency signal in accordance with the amplitude of the intermediate frequency signal; second heterodyning means for converting such distorted intermediate frequency signal to a distorted radio frequency signal; and a nonlinear radio frequency amplifier, fed by the second heterodyning means, adapted to operate in its nonlinear region near saturation to amplify such distorted radio frequency signal into the linearly amplified and retransmitted radio frequency signal, the characteristics of the distorting means being related to the nonlinear characteristics of the non-linear radio frequency amplifier, the improvement wherein such nonlinear means comprises:

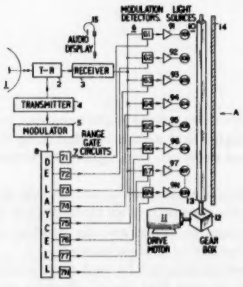
a. an amplitude level sensitive phase shifter; and,

b. an amplitude level sensitive amplifier serially coupled to such amplitude level sensitive amplifier.

3,922,675
MOVING TARGET DETECTION RADAR SYSTEM

Ronald Alfred Woodhams, Malvern, England, assignor to Ministry of Aviation, London, England

Filed Nov. 13, 1962, Ser. No. 237,393
Claims priority, application United Kingdom, Nov. 14, 1961, 40776/61
Int. Cl.² G01S 9/42
U.S. Cl. 343—7.7 **5 Claims**

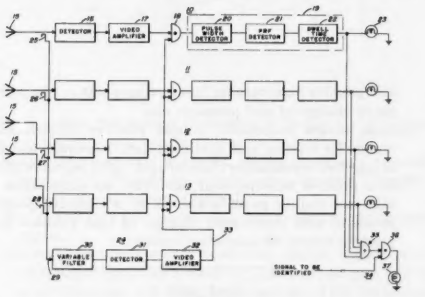


1. A radar system comprising means for transmitting pulse signals and for receiving signals reflected from targets, a plurality of range gates each for gating a received signal corresponding to a different range, a plurality of modulation detecting means each controlled from a different range gate for detecting the modulation of signals received from a moving target and displaying the detected signal as modulations of a light source, and viewing means for viewing the light sources to give linearly displaced images thereof, whereby a moving target is displayed by that light source which corresponds to the range of the target and the number of modulations of the source along the displacement line indicates the frequency and hence the rate of radial movement of the target.

3,922,676
SIGNAL SORTING DEVICE

William A. O'Berry; Eugene R. Fox, both of Severna Park, and Kenneth L. Plante, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 12, 1964, Ser. No. 410,816
Int. Cl.² G01S 9/06, 3/02
U.S. Cl. 343—17.1 PF **2 Claims**



1. Radar signal processing equipment for indicating the presence of a radiating source having predetermined characteristics, comprising:

a directional antenna array providing a plurality of outputs, each output corresponding, within a given resolution, to a particular angular segment of the space scanned by the antenna array;

a plurality of processing channels wherein each of the processing channels is connected to one of the outputs from the antenna array;

means in each processing channel to pass radar signals of only a particular carrier frequency;

pulse width detector means to pass demodulated pulse radar signals having less than a predetermined pulse width;

means connected to the pulse width detector to pass signals having only the proper repetition frequency; and

dwell time detector means responsive to a succession of pulses appearing during a predetermined interval, and to an absence of pulses during a second predetermined interval, to indicate the existence of a signal source having desired characteristics.

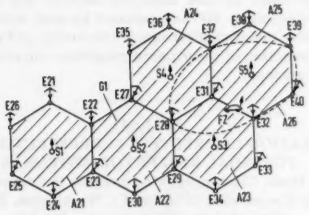
3,922,677
METHOD AND APPARATUS FOR DETERMINING THE POSITION OF SURFACE VEHICLES

Romuald V. Tomkewitsch, Ebenhausen, and Peer Thilo, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 29, 1973, Ser. No. 410,892
Claims priority, application Germany, Nov. 20, 1972, 2256880
Int. Cl.² G01S 5/06
U.S. Cl. 343—112 R **1 Claim**

1. An arrangement for use with a method for determining the position of vehicles which carry a transmitter which emits a measuring signal which is received by a plurality of receiving

stations and wherein the transit time differences of the measuring signal to different receiving stations the position of the vehicle is determined and wherein said plurality of receiving stations are located such that at least one particular orientation area is determined by the area enclosed by lines connected between three or more of said receiving stations and



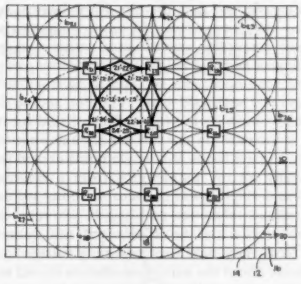
such that a particular vehicle whose position is being determined lies within said particular orientation area, and wherein said receiving stations are each equipped with several directional antennas which have high gain and which are arranged to receive signals from different directions such that the patterns of the antennas overlap.

3,922,678

POLICE ALARM SYSTEM

Marvin A. Frenkel, 901 W. Lafayette Blvd., Detroit, Mich. 48226

Filed Mar. 25, 1974, Ser. No. 454,570
Int. Cl.² G01S *11/00*; G08G *1/00*
U.S. Cl. 343—112 R **13 Claims**



7. In a method of selectively determining a location at which an alarm signal is generated, comprising the steps of:

arranging a plurality of wireless signal detectors having a substantially identical sensitivity for receiving a generated alarm signal in a fixed array of rows and columns along a selected topography such that said detectors are equidistantly spaced from one another;

generating a wireless signal anywhere on said selected topography of sufficient intensity to activate at least two adjacent ones of said detectors simultaneously, and

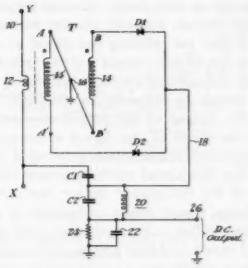
controlling the intensity of the generated wireless signal such that its distance-of-transmission substantially corresponds to the distance at which said detectors are equidistantly spaced from one another.

3,922,679

WIDE BAND RADIO-FREQUENCY PHASE SENSOR

Donn V. Campbell, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1974, Ser. No. 495,451
Int. Cl.² G01R *25/04*
U.S. Cl. 343—703 **3 Claims**



1. A device coupled to an RF antenna for providing a signal indicative of the resonance condition of the antenna comprising:

an RF transformer including a toroidal core having a primary winding, and first and second secondary windings coupled thereto;

each said first and second secondary windings including an insulated conductor, said conductors being twisted together symmetrically about each other from substantially one end to the other end of said secondary windings;

said one end of said first and said other end of said second secondary windings being connected in common and to ground;

matched rectifying means coupled to said other end of said first and said one end of said second secondary windings;

capacitive voltage dividing means connected between one end of said primary winding and ground;

the other end of said primary winding having means for feeding said antenna;

means connecting said matched rectifying means to said capacitive voltage dividing means; and

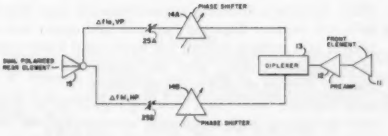
DC signal output means coupled to said rectifying means and said capacitance voltage dividing means for receiving a DC signal indicative of the antenna resonance condition.

3,922,680

SPACE FEED RECEIVER ARRAY

Dietrich A. Alsberg, Berkeley Heights, and Raymond D. Tuminaro, Livingston, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 28, 1974, Ser. No. 501,406
Int. Cl.² H01Q *3/26*
U.S. Cl. 343—754 **6 Claims**



1. An array antenna system comprising a plurality of cartridge means mounted in close spacial relationship to each other to form a unitary body; each cartridge means having an

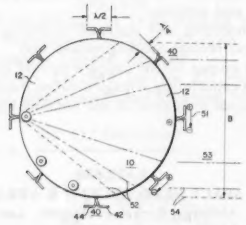
input and an output; a receiver unit having an input; each cartridge means detecting electromagnetic radiation entering its input and converting this radiation into an electrical signal which is split into two signals which are separately processed and are radiated out of the output of the cartridge means orthogonally polarized to each other; said receiver unit being located spacially from said plurality of cartridge means; the output radiations of said plurality of cartridge means being sent spacially to the input of said receiver unit; each cartridge means contains an elementary antenna located as the input of the cartridge means; a signal splitting means having an input and two outputs for splitting the signal at its input into two signals, one fed to one output and the other fed to the other output; said elementary antenna generating an electrical signal at its output in response to electrical magnetic energy received; the output of the elementary antenna being connected to the input of the signal splitting means; first and second phase shifters each having an input and an output; the output of the first signal splitting means being connected to the input of the first phase shifter; the other output of the phase splitting means being connected to the input of the second phase shifter; a dual polarized horn means having first and second inputs and first and second outputs; the output of the first phase shifter being connected to the horn means first input; the output of the second phase shifter being connected to the horn means second input; said horn means being the output of the cartridge means and generating the orthogonally polarized radiations; the output of each elementary antenna is a band of frequencies; and said signal splitting means being a diplexer means which divides the frequency band output of the elementary antenna into first and second frequency bands.

3,922,681

POLARIZATION ROTATION TECHNIQUE FOR USE WITH TWO DIMENSIONAL TEM MODE LENSES

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1974, Ser. No. 516,244
Int. Cl.² H01Q *15/04, 15/08, 19/08*
U.S. Cl. 343—754 **4 Claims**



1. A lens-antenna for transmitting and receiving high-frequency electromagnetic energy polarized with the direction of polarization parallel to the plane of the lens comprising:

an upper conducting plate;

a lower conducting plate substantially identical to said upper plate and disposed parallel and below said upper plate, forming a focusing region between said plates;

a dielectric section disposed between said upper and lower plates, said section having flat upper and lower surfaces in contiguous contact with said plates and filling a substantial portion of said focusing region;

means disposed within said focusing region for propagating and accepting high-frequency electromagnetic energy from at least one selected point within said focusing region; and

dipole means connected to said parallel plates for radiating and receiving high-frequency electromagnetic energy, said dipole means disposed at the periphery of said parallel plates and arranged to have the radiating sections of said dipole means lie parallel to the plane of said parallel plate lens, one pole of said dipole means connected to said upper plate and the other pole of said dipole means connected to said lower plate;

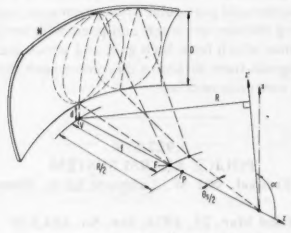
whereby electromagnetic energy polarized with the direction of polarization normal to the plane of said lens is propagated by said propagating means, focused into a beam shape by said dielectric section, and rotated in polarization by 90° and radiated by said dipole means, thereby radiating electromagnetic energy polarized with the direction of polarization parallel to the plane of said lens-antenna.

3,922,682

ABERRATION CORRECTING SUBREFLECTORS FOR TOROIDAL REFLECTOR ANTENNAS

Geoffrey Hyde, Clarksburg, Md., assignor to Communications Satellite Corporation (COMSAT), Washington, D.C.

Filed May 31, 1974, Ser. No. 475,226
Int. Cl.² H01Q *3/12, 15/16*
U.S. Cl. 343—761 **9 Claims**



1. In a toroidal reflector antenna system including a main reflector having the shape of a surface section of a torus of revolution and a feed-horn assembly positioned to illuminate said main reflector and thereby form beams in the desired directions of propagation, the improvement comprising an aberration correcting subreflector interposed between said main reflector and said feed-horn and forming a feed assembly with said feed-horn, the surface of said subreflector being nonconcentric with said main reflector and so designed that for the aberration correcting surface of said subreflector only one ray is incident on the surface at each point thereon, substantially all rays focus at a single point at said feed-horn and substantially all ray pathlengths from a reference aperture plane to said single point of focus are constant and equal to a predetermined reference pathlength, whereby said system is free of aberration and the efficiency of said system is independent of frequency, said feed assembly further being movable along an arc about the axis of revolution of said main reflector to provide substantially aberration free beams in scanning.

3,922,683

THREE FREQUENCY BAND ANTENNA

Richard J. Kumpebeck, Hicksville, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed June 24, 1974, Ser. No. 482,813
Int. Cl.² H01Q *21/26*
U.S. Cl. 343—797 **6 Claims**

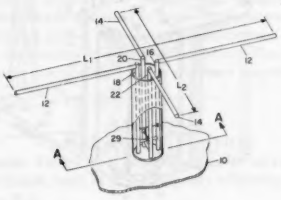
1. An antenna for radiating wave energy signals in first, second and third frequency bands, said second frequency band being intermediate to said first and third frequency bands, comprising:

an input port;

first means, responsive to wave energy signals supplied to said input port for radiating substantially only those signals which lie within said first and third frequency bands,

said first means including a first combination of a double-tuned radiator and a first transmission line coupling said radiator to said input port, said combination presenting a substantially matched impedance at said input port for signals in said first and third frequency bands and presenting a substantially mismatched impedance at said input port for signals in said second frequency band;

and second means, responsive to wave energy signals supplied to said input port for radiating substantially only



those signals which lie within said second frequency band, said second means including a single-tuned radiator and second transmission line coupling said single-tuned radiator to said input port, said combination presenting a substantially matched impedance at said input port for signals in said second frequency band and presenting a substantially mismatched impedance at said input port for signals in said first and third frequency bands for radiating signals which lie within said second frequency band.

3,922,684

RADIO ANTENNAE ENCASED IN DIELECTRIC TO REDUCE SIZE

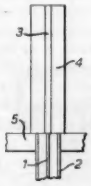
Hubert Charles Wright, Blisworth, England, assignor to Piessey Handel und Investments A.G., Essex, England

Filed June 12, 1974, Ser. No. 478,890

Claims priority, application United Kingdom, Aug. 30, 1973, 40810/73

Int. Cl.² H01Q *1/40, 9/32*

U.S. Cl. 343—831 **7 Claims**



1. A radio antenna comprising an electrical conductor in combination with low-loss high permittivity dielectric material formed of a mixture of titanates compacted under pressure to form a rigid structure, said dielectric material being a single cylindrical body of uniform diameter with a central hold bored therein to receive the electrical conductor along the length thereof.

3,922,685

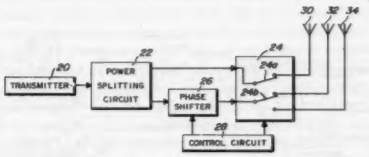
ANTENNA PATTERN GENERATOR AND SWITCHING APPARATUS

George F. Opas, Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 384,328, July 30, 1973, abandoned. This application Nov. 20, 1974, Ser. No. 525,543

Int. Cl.² H01Q *3/26*

U.S. Cl. 343—854 **11 Claims**



1. An antenna system used with a radio transmitter for creating a periodic sequence of individually distinct radiation patterns including in combination:

a power splitting circuit having a common terminal for connection to said radio transmitter apparatus and first and second splitting terminals;

a switching circuit having first and second signal terminals, a control terminal, and a plurality of antenna terminals, said switching circuit being responsive to signals applied to said control terminal for selectively connecting, in a predetermined manner with a gradual transition, one of said antenna terminals to said first signal terminal and another of said antenna terminals to said second signal terminal, said first signal terminal being coupled to said first splitting terminal;

a variable phase shifting circuit having first and second terminals and a control terminal, said phase shifting circuit having a predetermined phase shift between said first and second terminals and being responsive to signals applied to said control terminal for periodically changing, in a predetermined manner with a gradual transition, said phase shift between said first and second terminals, said first terminal being coupled to said second splitting terminal and said second terminal being coupled to said second signal terminal;

a plurality of radiating elements, each being connected to one of said antenna terminals of said switching circuit; and

a control circuit developing control signals for creating a periodic sequence of radiation patterns and being connected to said control terminal of said switching circuit and said control terminal of said variable phase shiftting circuit, said switching circuit being responsive to said control signals for selectively connecting, in a predetermined manner with a gradual transition, one of said radiating elements to said power splitting circuit and another of said radiating elements to said phase shifting circuit,

said gradual transitions of said switching circuit and said variable phase shifting circuit resulting in small amplitudes for the undesired frequencies created by the periodic changes of said switching circuit and said phase shifting circuit.

3,922,686

ELECTROCARDIOGRAPHIC RECORDING APPARATUS

Larry R. France, Ossining, and John G. Sherman, Yonkers, both of N.Y., assignors to Kent Cambridge Instrument Co., Ossining, N.Y.

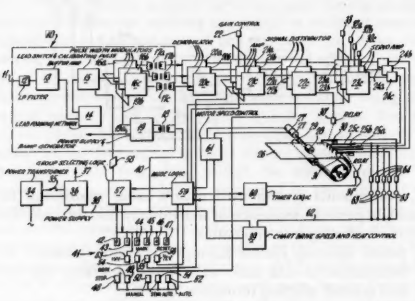
Filed Feb. 6, 1974, Ser. No. 439,908

Int. Cl. A61b *5/04;* **G01d** *5/25*

U.S. Cl. 346—33 ME **13 Claims**

1. Recording apparatus for electrocardiographic and other physiological signals comprising an input assembly having

means for attachment of a multiplicity of conductors such as electrocardiographic leads from a patient, and means for forming said leads into a plurality of signal pairs with said pairs being arranged in sets of at least two lead groups and forming one lead group producing zero voltage, an electrical signal recorder having at least two recording pens for recording said sets of lead groups on a recording chart and a chart drive



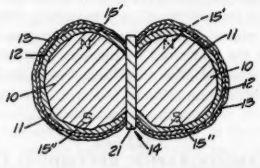
motor, amplifying means interconnected with each pen, lead group switching means including a plurality of switches in said input assembly for selectively switching each of said lead groups to said pens, logic control circuits including switching means therefore and control means interconnected with said lead group switching means and said logic control circuit for manually, semi-automatically and automatically interconnecting selected lead groups to said amplifiers.

3,922,687

MEANS AND METHOD FOR CREATING A VISIBLE DISPLAY UTILIZING HIGH SENSITIVITY MAGNETOCHEMICAL PARTICLES

Lyne S. Trimble, and Florence A. Ito, both of North Hollywood, Calif., assignors to Lyne S. Trimble, North Hollywood, Calif.

Division of Ser. No. 210,077, Dec. 20, 1971, Pat. No. 3,882,507. This application Aug. 26, 1974, Ser. No. 500,271
Int. Cl.² G03G *19/00*; G11B *5/84*; G01D *15/34*
U.S. Cl. 346—74.1 **6 Claims**



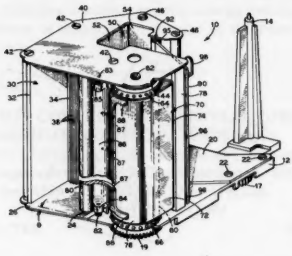
1. A supporting medium having a coating containing high sensitivity magnetochemical particles comprising two anisotropic masses of magnetic material and means capable of chemical activation in response to an applied magnetic field to provide a visible pattern in the area exposed to such magnetic field.

3,922,688

STRIP-CHART RECORDER

David A. Bates, Willoughby; Gary L. Christopher, Middleburg Heights, and George R. Hall, II, Euclid, all of Ohio, assignors to Bailey Meter Company, Wickliffe, Ohio

Filed July 22, 1974, Ser. No. 491,169
Int. Cl.² G01D *15/30*
U.S. Cl. 346—136 **8 Claims**



1. A transport cartridge for containing and horizontally transporting a Z-folded strip-chart maintained in vertical orientation comprising:
- a supply chamber for containing a Z-folded strip-chart
- a drive pulley for engaging said strip-chart in upright position from said supply chamber
- a take-up chamber having a floor which slopes away from said drive pulley at a preselected angle for receiving the strip-chart from said drive pulley
- a chassis vertically supporting said drive pulley, and take-up chamber

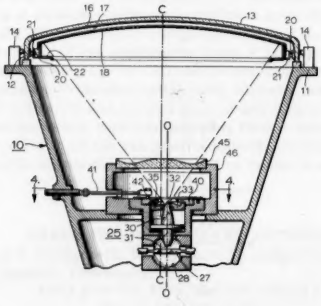
and means for controllably rotating said drive pulley.

3,922,689

OPTICAL SYSTEM FOR A LIGHTHOUSE ENCLOSURE

Yong S. Park, North Hanover Park, and Raymond J. Pekosh, Niles, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed May 1, 1972, Ser. No. 248,845
Int. Cl.² G03B *41/00*
U.S. Cl. 354—1 **6 Claims**



1. An exposure chamber for exposing portions of a photosensitive coating deposited on the target surface of a cathode ray tube face panel comprising:
- means for supporting said face panel on a reference axis of said exposure chamber;
- a mask and means for supporting said mask in a parallel spaced and confronting relation to said target surface, said mask having a pattern of apertures defining an expo-

sure pattern desired for application to said coating; and a coating illumination system comprising:

a source of radiation actinic to said coating,

means for collecting radiation from said source and for forming a small effective source offset from said reference axis a predetermined radial distance for off-axially irradiating said coating through said mask, and

radiation attenuating means comprising a stop immediately surrounding said effective source and having an asymmetrical radiation attenuation structure which is substantially aligned with the direction of said offset of said effective source from said reference axis and which is effective to reduce the illumination of the coating predominantly in areas on the same side of said reference axis as said effective source such as to reduce the asymmetry in illumination which results from the off-axis positioning of said effective source.

3,922,690

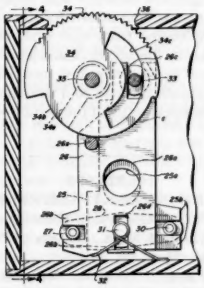
CAMERA CONSTRUCTION

Israel Nesson, Fair Lawn, and Thomas G. Graham, Point Pleasant Beach, both of N.J., assignors to Berkey Photo, Inc., Paramus, N.J.

Filed Sept. 25, 1974, Ser. No. 509,045

Int. Cl.² G03B 7/18

U.S. Cl. 354—49 **4 Claims**



1. A camera construction comprising a housing having a main lens; a first shutter means mounted on said housing for movement between a lens-blocking cocked position and a lens-unblocking uncocked position; a second shutter means adjacent said first shutter means and mounted on said housing for movement between a lens-unblocking cocked position and a lens-blocking uncocked position, both of said shutter means being biased to assume uncocked positions; a movable first release means mounted on said housing for normally retaining said first shutter means in a cocked position and adapted, when manipulated, to effect release of said first shutter means from said cocked position; a movable second release means mounted on said housing and adapted to be electrically energized and when energized retaining said second shutter means in a cocked position and when de-energized effecting release of said second shutter means from said cocked position, said second release means being energized by said first release means prior to the latter releasing said first shutter means; and time delay means within said housing and operatively connected to said second release means for varying the time interval between energizing and de-energizing of said second release means; said time delay means including a photoelectric cell spaced from said main lens and electrically connected to said second release means and adapted to receive a light beam from an external source through an opening in the housing, light intensity differential control means adjustably mounted within said housing for varying the intensity of the light received by said cell, said control means including a pair of apertured shield members arranged in face-to-face relation and disposed intermediate the photoelectric cell and the opening in the housing, each shield member having an aperture formed therein and in overlapping relation with the corresponding aperture of the other shield member, said shield members being interconnected for simultaneous movement in opposite directions to vary the amount of overlap of the corresponding apertures, the movement of one of said shield members being dependent upon the movement of the other shield member, the overlapped portions of said apertures being in continuous central alignment with the photoelectric cell, a manually adjustable means mounted on said housing for selectively effecting movement of one of said shield members to vary the amount of aperture overlap, said manually adjustable means being provided with a cam surface independent of the interconnection of said shield members, and spring means exerting a bias on at least one of said shield members whereby a portion of said one shield member is in continuous engagement with said cam surface.

3,922,691

ELECTRONIC SHUTTER FOR PHOTOGRAPHIC CAMERA

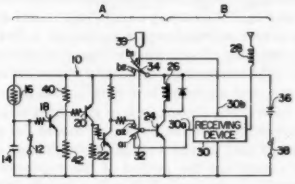
Kunio Matsumoto, Ageo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Dec. 17, 1973, Ser. No. 425,291

Claims priority, application Japan, Dec. 20, 1972, 47-127973

Int. Cl.² G03B 7/08, 9/58, 17/40

U.S. Cl. 354—51 **4 Claims**



1. An electronic shutter means for photographic cameras comprising a shutter, an electromagnet coupled to said shutter means for energizing said electromagnet so that said shutter is open when said electromagnet is energized and closed when said electromagnet is deenergized, an exposure time control circuit coupled to said electromagnet upon energization thereof and functioning to maintain said energized electromagnet in an energized condition and thereafter to deenergize said electromagnet after a time delay, a receiving device having a stand-by condition and responsive to a wireless control signal in said stand-by condition for generating an output signal, means responsive to said output signal for energizing said electromagnet energizing means when said receiving device receives a wireless control signal, and a change-over switch means coupling said electromagnet when it is deenergized to said receiving device, said change-over switch means being switched by energization of said electromagnet to thereby couple said electromagnet to said exposure time control circuit, said change-over switch means thereby connecting said electromagnet with said receiving device when said receiving device is in a stand-by condition for receiving the wireless control signal and with said exposure time control circuit in response to said receiving device receiving the wireless control signal.

3,922,692
EXPOSURE TIME CONTROL DEVICE FOR USE IN SINGLE LENS REFLEX CAMERA

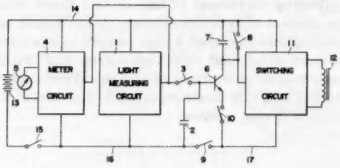
Kotaro Yata, Ikeda; Yasuhiro Nanba, Sakai, and Masayoshi Sahara, Tokyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 28, 1973, Ser. No. 429,391

Claims priority, application Japan, Dec. 28, 1972, 47-148516

Int. Cl.² G03B 9/62

U.S. Cl. 354—51 **6 Claims**



1. In an exposure time control device for use in a single lens reflex camera of the type which includes a shutter mechanism having front and rear curtains, a light measuring circuit receiving light rays passing through an objective lens and producing an output voltage representative of the value of brightness of a photographic object, a meter circuit responsive to said output voltage to indicate exposure time, storage means for storing said output voltage, a converting circuit having a low internal impedance for producing output current representative of the value of the stored voltage, an integrating circuit for integrating said output current simultaneously with the commencement of the travelling of said front curtain, a switching circuit for initiating the travelling of said rear curtain when said integrating circuit reaches a predetermined level, a power source for said light measuring circuit, said meter circuit, said integrating circuit and said switching circuit, a first lead wire connecting one pole of said power source to one terminal of each of said light measuring circuit, said meter circuit and said storage means, and a second lead wire connecting one terminal of said converting circuit to said switching circuit;

the improvement comprising switch means for preventing leakage of said stored voltage through said converting circuit except for the period of the exposure duration, said switch means including a first switch between said first and second lead wires and a second switch connected in series to said storage means and said second lead wire through said converting circuit, said first switch being closed in association with the release operation and opened in association with the commencement of the travelling of said rear curtain, and said second switch being closed in association with the commencement of the travelling of said front curtain and opened in association with the winding-up operation of the film.

3,922,693
CAMERA AUTOMATIC EXPOSURE CONTROL MECHANISM

Toru Matsui, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 2, 1974, Ser. No. 466,111

Claims priority, application Japan, May 5, 1973, 48-57828

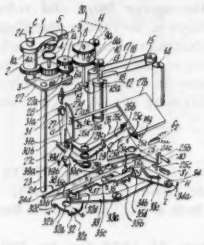
Int. Cl.² G03B 7/08, 17/38

U.S. Cl. 354—42 **9 Claims**

1. In a camera automatic exposure control device including means for adjusting the camera diaphragm aperture biased in the direction reducing the diaphragm aperture, means for releasably locking said adjusting means at a charged fully open diaphragm aperture position, means for releasing said adjusting means in accordance with shutter release operation of the camera, an electromagnet, means including an exposure control circuit having a photo-sensitive element receiving incident light from an object through said diaphragm aperture for energizing said electromagnet when the intensity of said incident light is reduced to a predetermined value, means for opening the camera shutter, and means for stopping said adjusting means and for actuating said shutter opening means when actuated by said energized electromagnet, the improvement which comprises:

second means for actuating said shutter opening means;

means for selectively, alternatively intercoupling and uncoupling said adjusting means and said second means



and including means shiftable between an effective position enabling engagement between said adjusting means and said second means and an ineffective position preventing engagement between said adjusting means and said second means; and means for manually transferring said shiftable means from said ineffective to effective position, whereby the action of said adjusting means upon release thereof by said releasing means is transmitted to said second means through said shiftable means to open the shutter independently of the condition of said electromagnet.

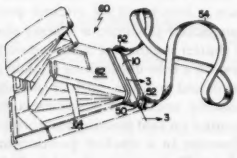
3,922,694
CARRYING STRAP ATTACHMENT FOR A PHOTOGRAPHIC CAMERA

Carl W. Davis, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1974, Ser. No. 430,069

Int. Cl.² A45C 11/38; G03B 17/02

U.S. Cl. 354—82 **12 Claims**



5. Photographic apparatus including a compact folding camera having first and second housing sections coupled for relative movement between folded and extended positions, and a carrying attachment for use in supporting said camera while in said extended position, comprising in combination:

support means;

means for securing a carrying strap to said support means;

means coupled to said support means for movement between a first operative position, in which said coupling means engage underlying edges of opposite sides of said first housing section for securing said support means to said camera, and a second inoperative position, in which said coupling means are out of securing relation with said first housing section, said coupling means including cam means engageable by said second housing section during movement of said first and second housing sections

towards said folded position for moving said coupling means from said first position to said second position.

3,922,695

PHOTOGRAPHIC CAMERA FOR USE WITH DIFFERENT TYPES OF PHOTOGRAPHIC FLASH DEVICES

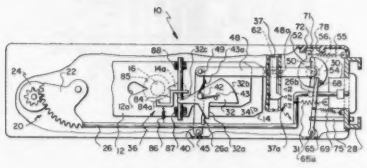
Hans Max Müller, Stuttgart-Wangen, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,285

Claims priority, application Germany, Jan. 24, 1974, 2403279

Int. Cl.² G03B 15/03

U.S. Cl. 354—141 5 Claims



1. In a camera of the type having means adapted for operatively receiving a photographic flash device of a first type and a photographic flash device of a second type, each of said flash devices having a particular flash guide number, the improvement comprising:

a. a guide number setting member settable to a plurality of positions each of which is indicative of a particular flash guide number;

b. an aperture control member operatively coupled to said guide number setting member movable between (1) a cocked position in which said aperture control member is ineffective to regulate lens aperture size and (2) a plurality of operational positions each of which is functionally related to lens aperture size; and

c. means actuatable upon coupling either of said flash devices to said flash-receiving means for rendering said aperture control member effective to regulate lens aperture size, said actuatable means including means for positioning said aperture control member in accordance with flash guide number at which said guide number setting member is set only when one but not the other of said flash devices is operatively coupled to said camera.

3,922,696

POWER-DRIVEN FILM WINDING AND SHUTTER RELEASE MECHANISM

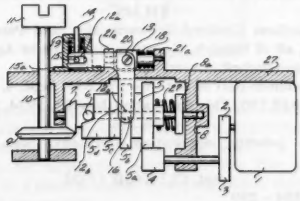
Akihiro Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1974, Ser. No. 523,252

Claims priority, application Japan, Nov. 19, 1973, 48-132701[U]

Int. Cl.² G03B 17/42, 19/04, 1/12

U.S. Cl. 354—212 4 Claims



1. In an automatic film transport type camera, the combination comprising:

an electromotor having a rotatable shaft;

a rotatable take-in shaft for the film;

a transmission mechanism for intermittently driving the take-in shaft in response to rotation of the motor shaft so that an unexposed portion of the film is transported to a position where it remains stationary during an exposure operation;

the transmission mechanism including a generally cylindrical member geared for rotation with the motor shaft, means for imparting a reciprocating translatory motion to the cylindrical member so that in the course of each revolution it translates toward and then away from a predetermined position, and means operatively engaged with the cylindrical member while it translates toward the predetermined position for rotatably driving the take-in shaft; and

means for actuating the exposure operation while the cylindrical member is translating away from the predetermined position.

3,922,697

DIAPHRAGM SHUTTER FOR PHOTOGRAPHIC CAMERAS

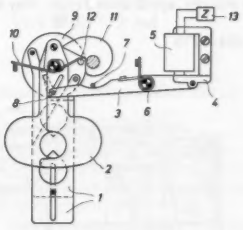
Heinz Waaske, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed May 3, 1974, Ser. No. 466,817

Claims priority, application Germany, May 8, 1973, 2323087

Int. Cl.² G03B 9/00

U.S. Cl. 354—228 9 Claims



1. A shutter for photographic cameras, comprising opening elements movable relative to each other to provide a light-admitting opening to initiate an exposure, closing elements movable relative to each other to block light to terminate the exposure, and control means for controlling movement of said opening elements at a relatively slow speed at the beginning of an exposure and gradually increasing the speed of opening movement of said opening elements during a subsequent interval of the exposure, said control means comprising an actuating device for directly actuating said opening elements, and a cam for driving said actuating device, said cam having a shape effective to produce said relatively slow speed followed by said gradually increasing speed.

3,922,698

DYNAMICALLY COMPENSATED EXPOSURE CONTROL SYSTEM

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 333,341, Feb. 16, 1973, which is a continuation of Ser. No. 245,800, April 21, 1972. This application Oct. 31, 1974, Ser. No. 519,410

Int. Cl.² G03B 9/40

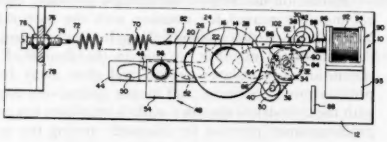
U.S. Cl. 354—235 17 Claims

1. An exposure control system for photographic apparatus comprising:

exposure mechanism means selectively movable in a first direction toward a first terminal position and in a second

direction toward a second terminal position to control light passage through an exposure aperture;

spring means normally operative to exert force against said exposure mechanism so as to move said exposure mechanism in said first direction toward said first terminal position, said spring means being actuable to exert force



against said exposure mechanism so as to move said exposure mechanism in said second position toward said second terminal position; and

means responsive to an electrical energy input to actuate said spring means such that said spring means moves said exposure mechanism in said second direction toward said second terminal position.

3,922,699

DIAPHRAGM MECHANISM FOR SINGLE LENS REFLEX CAMERA ADAPTED TO FACILITATE SUBSTITUTION OF INTERCHANGEABLE LENSES

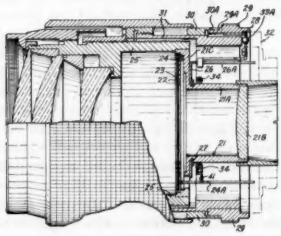
Michihiro Yamaki, 617 Iwato, Komae, Tokyo, Japan (182)

Filed May 3, 1974, Ser. No. 466,837

Claims priority, application Japan, May 4, 1973, 48-49038

Int. Cl.² G03B 9/02

U.S. Cl. 354—270 **8 Claims**



1. In a lens attachment for a camera comprising an adjustable aperture-defining diaphragm and a rotatable actuating plate connected to actuate said diaphragm when rotated, said diaphragm and plate being mounted on a common axis, the improvement which comprises:

a cam plate rotatably mounted on said common axis and having a plurality of distinct peripheral cam surfaces having different contours,

mounting means for connecting said attachment to a camera,

diaphragm control means mounted to engage a peripheral cam surface and connected to limit the rotation of said actuating plate in dependence on the point at which said diaphragm control means engages said cam surface,

interengaging means carried by said cam plate and said mounting means respectively for rotating said cam plate, and limit means on said mounting means for restricting the movement of said interengaging means and consequently of said cam plate to a selected one of a plurality of predetermined ranges, in each of which said diaphragm control means engages only a selected one of said peripheral cam surfaces.

3,922,700

FILM CASSETTE

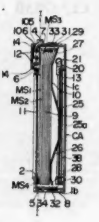
Yoshio Asano, Nishinomiya; Kazunobu Kato, Minami-ashigara; Yasumichi Ito, Minami-ashigara, and Kazutaka Yoshida, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 6, 1974, Ser. No. 440,219

Claims priority, application Japan, Feb. 10, 1973, 48-16899; Feb. 10, 1973, 48-16900

Int. Cl.² G03B 17/26

U.S. Cl. 354—276 **4 Claims**



1. A film cassette for containing monosheets or similar films, said cassette comprising:

1. a protective case made of a light-proof material in which monosheets may be packed and having

a. a front opening through which light may be passed to expose a foremost monosheet in said case and

b. an extraction outlet which is in line with the position of a foremost monosheet in said case and through which such a foremost monosheet may be withdrawn from said case;

2. a pressure means for urging monosheets in said case towards the front of said case, whereby successive monosheets may be brought to the foremost position for exposure;

3. a movable light-proof sheet within said case for protecting monosheets in said case from exposure to light;

4. a means for removing said light-proof sheet from said front opening of said case to expose the foremost monosheet in said case to light;

5. an extraction outlet cover normally sealing said extraction outlet but actuable to open said extraction outlet when the foremost monosheet is withdrawn from said case;

6. a recharge inlet formed at the opposite side of said case from said extraction outlet, whereby monosheets may be supplied into said case;

7. a recharge inlet cover normally sealing said recharge inlet but actuable to open said recharge inlet; and

8. an externally actuable drive means for drawing the foremost monosheet in said case through said extraction outlet when the cassette is mounted in a camera.

3,922,701

APPARATUS FOR PROCESSING PHOTOGRAPHIC FILMS

Erwin Geyken; Gerhard Schwarzmaier, and Peter Dawidowitsch, all of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 393,834, Sept. 4, 1973, Pat. No. 3,832,730. This application July 22, 1974, Ser. No. 490,296

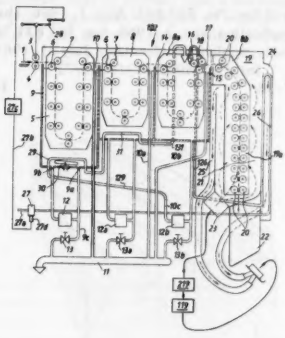
Claims priority, application Germany, Sept. 2, 1972, 2243276

Int. Cl.² G03D 13/00

U.S. Cl. 354—299 **10 Claims**

1. In a processing apparatus for exposed films or analogous sheet — or web-like carriers of photosensitive material, a combination comprising a series of vessels each containing a

supply of a processing liquid; a dryer; means for circulating in said dryer a heated gaseous fluid; means for transporting carriers of photosensitive material through successive vessels and thereupon through said dryer; a source of unheated liquid;



and a heat exchanger connectable with said source and installed in said dryer so that unheated liquid which is supplied by said source is heated in said heat exchanger, said heat exchanger having an outlet which discharges heated liquid into one of said vessels.

3,922,702

LIQUID CIRCULATING SYSTEM FOR PHOTOGRAPHIC FILM PROCESSING TANKS

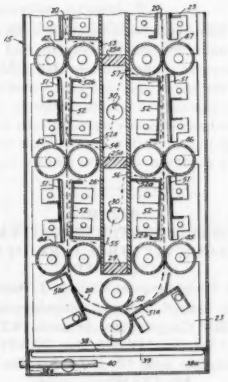
Alfred J. Gaskell, Hopkins, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed May 18, 1973, Ser. No. 361,604

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G03D *3/06*

U.S. Cl. 354—321 **8 Claims**



1. In a photographic film processing tank with processing liquid therein and including means for transporting a web of film in a guided film path through said tank;

a system for circulating portions of the film processing liquid in a predetermined flow path within the tank, said system comprising

an intake manifold located within the tank and having the major portion thereof disposed below the surface of the processing liquid in the tank and including

side wall portions having a plurality of intake openings disposed in close association to the film path on the emulsion side thereof,

liquid flow control means within the tank and disposed outside of said manifold and defining a liquid flow path generally parallel to and adjacent said film path

the position of the intake openings being such that the liquid is drawn through said openings at the downstream end of its flow path to cause the liquid to flow through said flow path in the same direction of travel as said film,

means for producing negative pressure in the manifold to withdraw liquid from the tank into the manifold through said openings, and

means for intorducing the withdrawn liquid back into the processing tank at a location remote from said flow path.

3,922,703

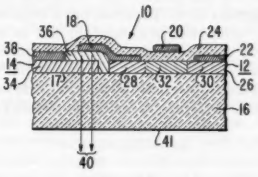
ELECTROLUMINESCENT SEMICONDUCTOR DEVICE

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,405

Int. Cl.² H01L *33/00*

U.S. Cl. 357—17 **6 Claims**



1. An electroluminescent semiconductor device comprising:

a transparent substrate with a surface;

a silicon semiconductor element at said surface; and

a gallium nitride electroluminescent semiconductor element on said surface, electrically connected to said silicon semiconductor element, and having;

a. a layer of n^+ highly conductive gallium nitride on said substrate:

b. an insulating layer of gallium nitride on said conductive gallium nitride layer and on said substrate, such that light generated in said insulating gallium nitride layer passes through said conductive gallium nitride layer and said substrate and is emitted from said device;

c. an electrode on said layer of conductive gallium nitride; and

d. an inter-element contact on said layer of insulating gallium nitride and said silicon semiconductor element, electrically connecting said gallium nitride electroluminescent semiconductor element to said silicon semiconductor element.

3,922,704

METAL OXIDE SEMICONDUCTOR INTEGRATED CIRCUIT OF REDUCED SIZE AND A METHOD FOR MANUFACTURING SAME

Robert J. Huber, Bountiful, and Kent F. Smith, Salt Lake City, both of Utah, assignors to General Instrument Corporation, Clifton, N.J.

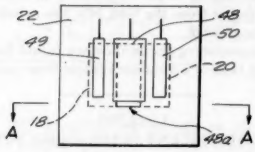
Division of Ser. No. 411,444, Oct. 31, 1973, Pat. No. 3,874,937. This application Nov. 4, 1974, Ser. No. 520,284

Int. Cl.² H01L *29/78*

U.S. Cl. 357—23 **12 Claims**

1. In a metal oxide semiconductor of the type having a substrate of a first conductivity type doped with second conductivity type determining impurities to form separate source and drain regions therein which are separated by a channel

region having a length equal to the space between the source and drain regions and a width equal to the interface between either the source or drain region and the channel region and wherein the channel region has an overlying thin insulating layer upon which a gate electrode is situated to cover the entire length and a part only of the width of the channel region



such that part of the width of the insulating layer is exposed and the remainder of the substrate has a thick insulating layer thereon, the improvement comprising one or more first conductivity type regions in the channel region underlying the exposed thin insulating layer to eliminate the uncontrollable conducting path between the source and drain regions caused by the exposed insulating layer in the channel region.

3,922,705

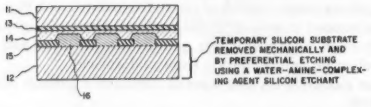
DIELECTRICALLY ISOLATED INTEGRAL SILICON DIAPHRAM OR OTHER SEMICONDUCTOR PRODUCT

Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 366,379, June 4, 1973, abandoned. This application Nov. 27, 1974, Ser. No. 527,550

Int. Cl.[2] H01L *29/84, 29/96*

U.S. Cl. 357—26 **1 Claim**



1. A dielectrically isolated integral silicon diaphragm comprising

a pressure responsive single crystal silicon substrate,

a patterned silicon dioxide layer having at least one opening in which is formed a single crystal silicon strain gage component,

said single crystal silicon substrate and said patterned silicon dioxide layer with a single crystal silicon strain gage component being completely dielectrically isolated and bonded together with at least one other intermediate silicon dioxide insulating layer and one intermediate glass bonding layer,

said glass bonding layer consisting essentially in mole percent of 15–20 percent boric oxide and 80–85 percent silicon dioxide, and having a thermal expansion coefficient that approximately matches the thermal expansion coefficient of silicon said substrate being made of n-type silicon, and said glass bonding layer having a thickness between 0.5 and 5 microns.

3,922,706

TRANSISTOR HAVING EMITTER WITH HIGH CIRCUMFERENCE-SURFACE AREA RATIO

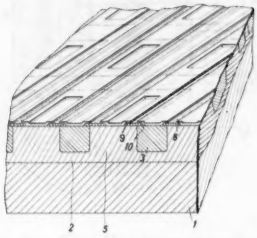
Reinhold Kaiser, Heilbronn, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm, Danube, Germany

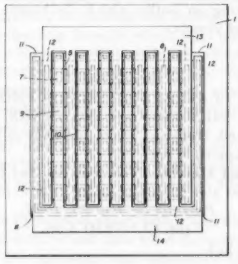
Continuation of Ser. No. 569,445, Aug. 1, 1966, abandoned. This application Nov. 3, 1969, Ser. No. 871,760

Claims priority, application Germany, July 31, 1965, 29116

Int. Cl.[2] H01L *27/10, 29/72*

U.S. Cl. 357—36 **10 Claims**





1. A planar transistor comprising a semiconductor base region, a semiconductor collector region, and a semiconductor emitter region on a semiconductor slab, said emitter region being a single electrical unit and perforated in a sieve-like structure with a plurality of openings therein, semiconductor portions of said base region extending into the openings of said emitter region, said portions of the base region extending to a slab surface common with said emitter region.

3,922,707

DC TESTING OF INTEGRATED CIRCUITS AND A NOVEL INTEGRATED CIRCUIT STRUCTURE TO FACILITATE SUCH TESTING

Larry E. Freed, Poughkeepsie; William J. Nestork, Wappingers Falls, and Daniel Tuman, Poughkeepsie, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 319,586, Dec. 29, 1972, abandoned. This application June 10, 1974, Ser. No. 477,871

Int. Cl.[2] H01L *27/04*

U.S. Cl. 357—48 **6 Claims**

1. In an integrated semiconductor circuit comprising a plurality of active and passive devices interconnected by conductive means into a selected circuit configuration,

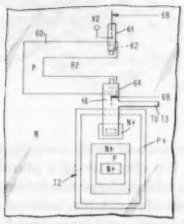
a structure for eliminating a circuit path which would be alternative to a first path between two circuit nodes in the event of a structural failure within said first path comprising

a resistor region of one conductivity-type in said first path connecting said two circuit nodes, said resistor being

surrounded by a substrate of opposite conductivity-type and,

a pair of contacts to said resistor for connecting said resistor into said first path, and

a pair of regions of said opposite conductivity-type, each respectively also in contact with a corresponding one of said pair of contacts, said pair of regions being fully enclosed by and, thereby, junction-isolated from each other



by said resistor region, and disposed outside of the most direct linear path between said pair of contacts within said resistor,

whereby, in the event said resistor is missing and said junction isolation not present, a path is provided between said pair of contacts through said pair of opposite-type regions which shunts and, thereby, eleminates said alternative circuit path.

3,922,708

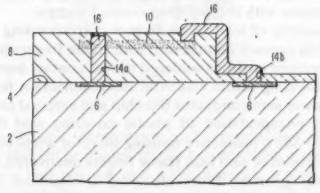
METHOD OF PRODUCING HIGH VALUE ION IMPLANTED RESISTORS

Billy L. Crowder, Putnam Valley, and Swie-In Tan, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 4, 1974, Ser. No. 448,100

Int. Cl.² H01L *27/02*

U.S. Cl. 357—51 **6 Claims**



1. A semiconductor wafer having a network of electrical circuitry on its surface,

an insulating layer over said surface, resistive elements imbedded by ion implantation within the body of said insulating layer, said elements having resistivities of 10^7 to 10^9 ohms/square, and

means in said insulating layer for allowing electrical connection between said electrical circuitry and said resistive elements.

3,922,709

SEMICONDUCTING ELEMENT HAVING IMPROVED VOLTAGE ENDURANCE PROPERTIES

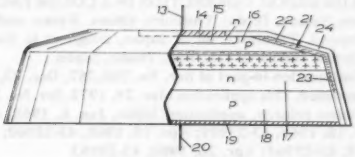
John Torkel Wallmark, Goteborg, and Mieczyslaw Bakowski, Angered, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Sweden

Filed Nov. 16, 1973, Ser. No. 416,669

Claims priority, application Sweden, Nov. 17, 1972, 14937/72

Int. Cl.² H01L *29/40, 29/34, 23/28, 29/74*

U.S. Cl. 357—53 **13 Claims**



1. An improved high voltage semiconductor element comprising, a body of semiconductor material having a p-doped region and an n-doped region and a pn-junction therebetween, said pn-junction intersecting the surface of said body, and an isolating surface layer at least at said intersection and on both sides thereof, said surface layer having a permanent electrical charge, said p-region having a degree of doping which increases with the distance from said pn-junction, the improvement which comprises a first portion of said surface layer at the surface of said p-region adjacent said intersection, and a second portion of said surface layer at the surface of said n-region adjacent said intersection and contiguous with said first portion, and said first portion having a permanent surface charge which is negative relative to the permanent surface charge of said second portion.

3,922,710

SEMICONDUCTOR MEMORY DEVICE

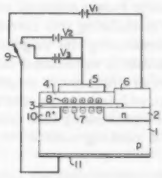
Susumu Koike, Fujiidera, Japan, assignor to Matsushita Electronics Corporation, Kadoma, Japan

Continuation of Ser. No. 314,901, Dec. 13, 1972, abandoned. This application May 2, 1974, Ser. No. 466,319

Claims priority, application Japan, Dec. 17, 1971, 46-103082; Dec. 17, 1971, 46-103083

Int. Cl.² H01L *29/88, 29/90, 29/78, 29/34*

U.S. Cl. 357—54 **6 Claims**



1. A semiconductor memory device comprising:

a. a semiconductor substrate of one conductivity type;

b. first and second semiconductor regions of the opposite conductivity type to that of said substrate, formed in the surface of said substrate and forming first and second PN junctions with said substrate, respectively, the breakdown voltage of said first PN junction being higher than that of said second PN junction;

c. a laminated structure formed on the surface of said substrate between said first and second semiconductor regions, the laminated structure including a first insulting film having a thickness within the tunneling distance of

charge carriers under the application of a predetermined voltage, and a second insulting film formed on said first insulating film, said second insulating film forming trapping centers near the interface between said first and second insulating films;

d. signal writing means disposed on said laminated structure for applying thereto a voltage signal above said predetermined voltage; and

e. signal reading means disposed on said first semiconductor region for deriving the signal stored in the memory.

3,922,711

COLOR SIGNAL CORRECTION IN A COLOR FACSIMILE

Kaoru Sasabe, Ikeda; Yoshihiro Okino, Kyoto, and Heijiro Hayami, Takatuski, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

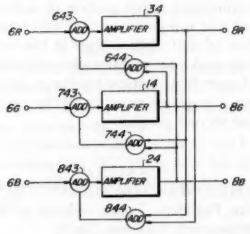
Continuation-in-part of Ser. No. 786,267, Dec. 23, 1968, abandoned. This application Mar. 29, 1972, Ser. No. 239,289

Claims priority, application Japan, Jan. 6, 1968, 43-1025; Apr. 18, 1968, 43-25959; Apr. 18, 1968, 43-25960; Apr. 18, 1968, 43-25961; Apr. 26, 1968, 43-28983

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H04N 1/46

U.S. Cl. 358—75 **3 Claims**



1. A color correction method for color facsimile transmission comprising the steps of: separating color signals of red, green and blue from a composite color signal obtained from an original picture signal; generating a plurality of carrier signals of a common frequency and phase from a common carrier generator; modulating said carriers with said separated color signals by irradiating the original picture with a light source whose intensity is modulated in synchronization with said common carrier frequency; amplifying the modulated carrier signals in amplifying means; and electrically correcting said color signals by processing said modulated and amplified carrier signals in a masking matrix circuit arranged to form feedback loops.

2. A color correction method for color facsimile transmission comprising the steps of: separating color signals of red, green and blue from a composite color signal obtained from an original picture signal; generating a plurality of carrier signals of a common frequency and phase from a common carrier generator; modulating said carriers with said separated color signals; amplifying the modulated carrier signals in amplifying means; grouping said amplified signals into combinations of two amplified signals each; adding said two amplified signals in each combination together; and adding the outputs of each of said combinations to the input of the corresponding amplifying means which produces an amplified signal not grouped with the combination whose output is being added to said corresponding amplifying means input.

3,922,712

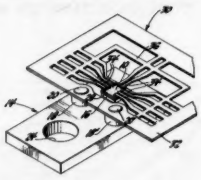
PLASTIC POWER SEMICONDUCTOR FLIP CHIP PACKAGE

Harry L. Stryker, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 1, 1974, Ser. No. 465,820

Int. Cl.² H01L 23/02

U.S. Cl. 357—81 **2 Claims**



1. An economical and easily assembled package for a power semiconductor flip chip having a plurality of closely spaced contact bumps, said package comprising:

a base member of malleable, solderable and thermally conductive material, said base member having two major parallel surfaces;

a pedestal integral with said base member and extending from one surface thereof, said pedestal having a face parallel to said base member surface, said pedestal face having a rectangular geometry precisely conforming to the backside of a rectangular power semiconductor flip chip so that said chip can be automatically oriented thereon for alignment with a lead frame structure having a plurality of spaced inwardly converging cantilevered fingers corresponding to the contact bumps on the flip chip;

a layer of solder on the pedestal face;

a power semiconductor flip chip having a plurality of closely spaced contact bumps on the front side thereon, said flip chip being bonded to said pedestal in precise congruency therewith by said solder layer thereby providing a heat sink for the flip chip and automatically positioning said contact bumps in a predetermined location;

at least two alignment bosses integral with said base member and having integral pin projections extending from said one base member surface, said bosses being spaced from said pedestal, an integral shoulder on each of said bosses in the same plane defined by said flip chip contact bumps for engagement with said lead frame structure surrounding openings therein corresponding with said pins to automatically align and engage the lead frame fingers with the flip chip contact bumps;

a plurality of lead frame fingers corresponding to said flip chip contact bumps, said lead frame fingers having inner free end portions soldered to said contact bumps thereby providing direct electrical interconnection between said power semiconductor flip chip and external circuitry; and

an encapsulation of plastic covering said flip chip to provide a protective housing therefor while leaving outer portions of said lead frame fingers uncovered so that they may provide direct electrical connections to external circuitry.

3,922,713

UNIDIRECTIONAL COLOR ENHANCEMENT CIRCUIT

Robert Charles Wheeler, Elba, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

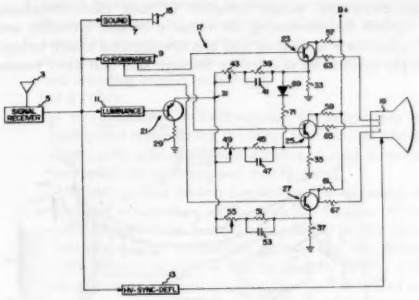
Filed July 15, 1974, Ser. No. 488,729

Int. Cl.² H04N 5/14, 9/52

U.S. Cl. 358—37 **10 Claims**

1. In a color television receiver having a luminance and color matrix system wherein first, second, and third color amplifier stages each have an output electrode coupled to a

load circuit for applying a color signal to a cathode ray tube, an input electrode coupled to one of a plurality of color difference signal sources, and a second input electrode coupled by a drive circuit to a luminance signal source, the improvement



comprising a unidirectional color enhancement circuit including a unidirectional conduction device and an impedance series coupling the second input electrode and drive circuit of two of said first, second, and third color amplifier stages.

3,922,714

DEVICE FOR TRANSMITTING AND REPRODUCING COLOR PICTURES

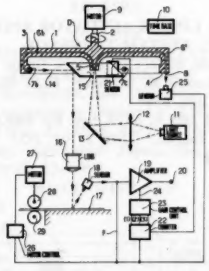
Jean-Henri Delavie, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Oct. 18, 1973, Ser. No. 407,655

Claims priority, application France, Oct. 18, 1972, 72.36926

Int. Cl. H04n *1/46, 3/00;* **G02b** *5/14*

U.S. Cl. 358—75 **13 Claims**



1. Device for the transmission and reproduction of color pictures by the trichromatic method comprising a rotatable disc having a hub portion and a rim portion, a plurality of optical fibers extending radially in said disc between said hub portion and said rim portion, the end of one of the optical fibers disposed in the rim portion of said disc extending in a direction different from the ends of the other optical fibers disposed in the rim portion, first optical means for applying light to all of the ends of said optical fibers in said hub portion, second optical means for projecting light from the ends of said other optical fibers disposed in said rim portion, first control means for detecting light at the output of said one end of the optical fibers in said rim portion, second control means for detecting successively the light at the ends of said other optical fibers disposed in said rim portion, and third control means responsive to said first and second control means for controlling one of said first and second optical means.

3,922,715

RECORDING AND REPRODUCING APPARATUS FOR VIDEO SIGNALS USING A VIDEO STORAGE TUBE AND AN AUDIO TAPE RECORDING DEVICE

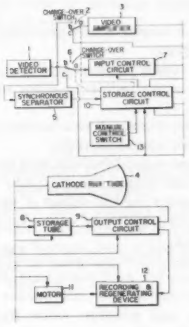
Masayoshi Hirashima, Ibaragi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 10, 1973, Ser. No. 358,964

Claims priority, application Japan, May 11, 1972, 47-46944; May 16, 1972, 47-48747; May 16, 1972, 47-48763

Int. Cl.² H04N *5/78*

U.S. Cl. 360—9 **10 Claims**



1. Apparatus for receiving video and audio information signals, recording the video and audio signals and reproducing picture images and sound represented by said video and audio signals, comprising:

a broadband storage tube;

recording means having relatively narrow band capability;

means for storing a field of received video information signals in said storage tube at a relatively fast rate;

means for reading out the video information from said storage tube at a relatively slow rate and recording said video information in said recording means;

means for recording received audio information signals in said recording means;

means for reading out the video information in said recording means at a relatively slow rate and re-storing said video information in said storage tube;

means for displaying picture images represented by the video information re-stored in said storage tube;

means for reproducing sounds represented by the audio information in said recording means;

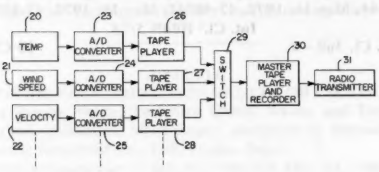
said recording means having a plurality of channels; and

means for recording control signals including horizontal and vertical synchronizing signals correlated with the scanning rate of the video information on a first of said channels and for simultaneously recording said video information on a second of said channels, said means for reading out and restoring video information comprising means controlling the scanning of said storage tube in response to said horizontal and vertical synchronizing signals when video information in said recording means is re-stored in said storage tube.

3,922,716
AIR TRAFFIC CONTROLLER AID

Abraham Arnold, Silver Spring, Md.

Filed Aug. 15, 1974, Ser. No. 497,774
Int. Cl. G11b *5/00*
U.S. Cl. 360—12 **20 Claims**



1. Apparatus for automatically providing air traffic control assistance comprising:

a. at least one sensor for sensing a specific parameter and providing an output indicative of the value of said specific parameter;

b. an information storage device having a plurality of different verbal data stored thereon;

c. pick-up means associated with said storage device;

d. converter means coupled to the output of said at least one sensor for converting the output of said at least one sensor to a position value of said pick-up means on said storage device;

e. means coupled between said converter means and said pick-up means for positioning said pick-up means to a specific location on said information storage device in response to said position value from said converter means, thereby selecting a specific data bit from said plurality of data stored on said information storage device, said specific data bit being a verbal statement of the value of said parameter as measured by said at least one sensor at that time, a different data bit being selected each time the output of said at least one sensor indicates that the value of said paramter has changed;

f. a record/playback storage device having a record input and a playback output;

g. means to couple said pick-up means to said record input of said record/playback storage device to thereby record at a specific location on said record/playback storage device in verbal form said selected data bit; and

h. a radio transmitter coupled to said playback output of said record/playback storage device for transmitting said selected data bit, whereby said radio transmitter transmits said value of said parameter with said value being constantly updated so that said value transmitted is the correct value of said parameter at the time of transmission.

3,922,717
SPIRAL DISC RECORDER USING A SINGLE MOTOR FOR TURNTABLE AND HEAD DRIVE

Joseph J. Zimmermann, Elm Grove, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 4, 1974, Ser. No. 529,327
Int. Cl.² G11B *21/04*, *17/02*
U.S. Cl. 360—75 **4 Claims**

1. In a telephone answering device having a turntable for rotating a grooveless disc positioned thereon and a movable tone arm having a magnetic transducer for selectively playing back a message magnetically recorded on said disc in a spiral track, apparatus comprising:

a follower arm coupled to said tone arm;

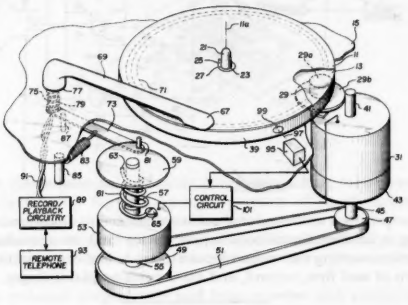
a cam having a spirally contoured peripheral edge contacting said follower arm;

an electromagnetic clutch coupled to said cam;

a motor drive means intercoupling said motor and said turntable for rotating said turntable;

belt drive means intercoupling said motor and said electromagnetic clutch for supplying drive from said motor to said electromagnetic clutch; and

optoelectronic means coupled to said electromagnetic clutch for monitoring the rotation of said turntable and selectively activating said electromagnetic clutch to supply drive from said motor through said belt drive means



to rotate said cam responsive to the intial rotation of said turntable through a predetermined rotational position,

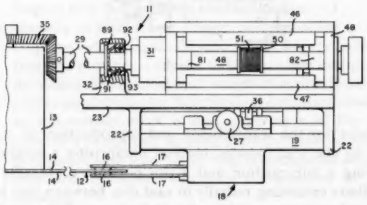
whereby said cam moves said follower arm as said cam rotates to correspondingly move said tone arm laterally across said rotating disc, and

said optoelectronic means synchronizes the initiation of said tone arm movement with a particular rotational position of said turntable so that said transducer follows said spiral track.

3,922,718
DISC DRIVE LINEAR ACTUATOR AND CONTROL SYSTEM THEREFOR

Martin O. Halfhill, 6876 Castle Rock Drive, San Jose, Calif. 95120, and Russell K. Brunner, 1039 Wood Duck Ave., Santa Clara, Calif. 95451

Filed July 8, 1974, Ser. No. 486,408
Int. Cl.² G11B *21/08*, *5/55*
U.S. Cl. 360—78 **27 Claims**



1. A random access memory apparatus comprising:

A. a rotating magnetic recording disc for data storage;

B. a data transfer head for interaction with a record surface of said disc;

C. a linear actuator for moving said transfer head across the record surface of said disc between radially spaced address locations; said linear actuator comprising:

1. a carriage on which said transfer head is mounted;

2. a track on which said carriage is mounted for travel on a path providing movement of said transfer head between said radially spaced address locations;

3. a drive shaft having a cylindrical surface;
4. a support mounting said driveshaft for rotation thereof about the axis of said cylindrical surface and with said axis of said cylindrical surface generally parallel to said path;
5. power means connected to said driveshaft for rotating the same about said axis of said cylindrical surface;
6. coupling means for converting rotary motion of said driveshaft into translational motion of said carriage, said coupling means including:
   (a) a roller;
   (b) means carried by said carriage for supporting said roller and maintaining the same in frictional engagement with said cylindrical surface of said driveshaft to be driven into rotation thereby; and
   (c) roller control means for selectively changing the angular orientation of the axis of rotation of said roller between an orientation parallel to the axis of rotation of said cylindrical surface and one oblique with respect thereto in which rotation of said driveshaft causes motion of said roller and hence of said carriage along said path to provide said movement of said transfer head between said address locations on said record surface;

D. a position sensor for determining the position at any given time of said transfer head relative to a desired address location; and

E. a position servo control responsive to said position sensor indicating a difference between the position of said head and a desired address location by regulating said roller control means to change the angular orientation of said axis of rotation of said roller to one resulting in motion of said carriage in a direction moving said head to said desired address location.

3,922,719

PLAYING METHOD OF TAPE PLAYER AND AN EQUIPMENT THEREOF

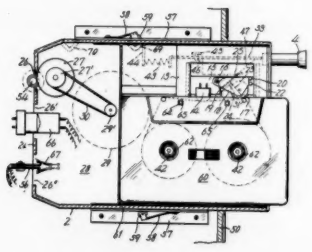
Tokuji Negishi, Kawaguchi, and Motomasa Yoshida, Tokyo, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1968, Ser. No. 787,386

Claims priority, application Japan, Dec. 29, 1967, 43-84731; Feb. 3, 1968, 43-7707

Int. Cl.² G11B *5/00*

U.S. Cl. 360—88 **7 Claims**



1. An adapter for playing a cassette type tape cartridge in a tape player for endless tape cartridges comprising a detector, an adapter housing at least the vertical cross-section of which is the same as that of the endless tape cartridge, and having a compartment for the cassette type tape cartridges, a head mounted in said housing, a tape feeding capstan mounted in said housing, means for electrically connecting said head to a head in the tape player, means for driving said capstan being connectable to the tape player capstan drive, and a pair of driving wheels positioned for engaging with the reel shafts of an inserted cassette type tape cartridge, wherein said housing has pivotally connected upper and lower cases, the upper one of said cases including said compartment and means for driving said driving wheels arranged in the other of said cases, including a sliding plate mounted in said upper case, a holding frame pivotally mounted on said sliding plate, a head on said holding frame, a pinch roller on said holding frame, a guiding piece on said holding frame, a push button operable controlling piece slidably extending through said lower case, a cam carried by said controlling piece positioned for engaging said guiding piece when said cases are together to permit the manual movement of said sliding frame and thus said head and pinch roller to operative engagement with the tape of an inserted cartridge.

3,922,720

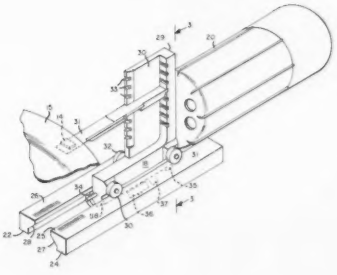
CARRIAGE ASSEMBLY FOR A MAGNETIC DISC STORAGE DRIVE

Robert H. Caletti, Menlo Park; Timothy W. Martin, San Jose, and Ronald L. Swain, Sunnyvale, all of Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.

Filed Jan. 9, 1974, Ser. No. 432,009

Int. Cl. G11b *21/08*

U.S. Cl. 360—106 **5 Claims**



1. A disc storage apparatus having a carriage assembly for supporting magnetic read/write heads that access selected data tracks on magnetic discs, consisting of:

a carriage support baseplate having a central longitudinal axis defining the direction of travel of the carriage as it moves back and forth to position the heads relative to selected data tracks,

first and second rails supported on the baseplate in parallel spaced relationship one to each side of the longitudinal axis with each rail having a flat top surface and a flat side surface at least partially facing the opposite rail, and

a moveable carriage having rotatably mounted thereon a first set of roller bearings having at least one roller bearing riding on each of the rail top surfaces and a second set of roller bearings having at least one roller bearing bearing against each of the flat side surfaces for travel along the longitudinal axis.

DESIGNS PATENTS

GRANTED NOVEMBER 25, 1975

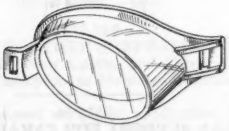
ERRATA

For CLASS	See PATENT NO.
055–001 A	237,824
056–004	237,826

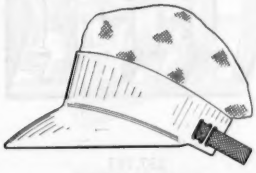
DESIGNS

NOVEMBER 25, 1975

237,757
GOGGLE EYEPIECE
Lloyd S. Turner, Los Gatos, Calif., assignor to Hind-Wells, Inc., San Luis Obispo, Calif.
Filed May 23, 1974, Ser. No. 472,729
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234



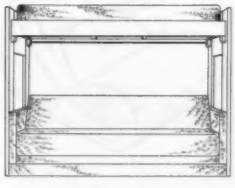
237,758
EYE SHADE WITH REMOVABLE CROWN
Erline L. Huffman, 7350 Deep Run, Birmingham, Mich. 48010
Filed Nov. 24, 1972, Ser. No. 309,185
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—244



237,759
SPORTS CAP
H. Leonard Sebring, P.O. Box 465, Gardner, Kans. 66030
Filed Mar. 6, 1974, Ser. No. 448,507
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—248

237,760
CHIN STRAP FOR A HELMET
Richard L. Woods, 1514 SW. 77 Terrace, Oklahoma City, Okla. 73159
Filed June 11, 1973, Ser. No. 368,704
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—260

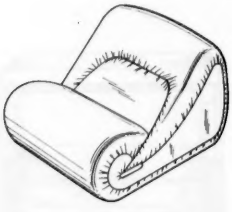
237,761
COMBINATION BUNK BED AND SOFA
Samuel D. Neyman, Fayetteville, Tenn. (5015 Parkwood Drive NW., Huntsville, Ala. 35810)
Filed Apr. 26, 1974, Ser. No. 464,912
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—4



237,762
ARROW STAND
R. Lynn Hendry, 840 Grelle, Lewiston, Idaho 83501
Filed Apr. 18, 1974, Ser. No. 461,989
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—20

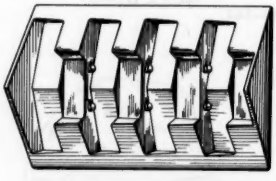
237,763
UPHOLSTERED CHAIR
Henry James, Pontiac, Ill., assignor to Pontiac Furniture Industries, Inc., Pontiac, Ill.
Filed Nov. 8, 1972, Ser. No. 304,848
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

237,764
EASY CHAIR
Jean Prevost, 18 Bis, Rue Danielle Casanova, 94 170 Le Perreux, France
Filed Aug. 21, 1973, Ser. No. 389,655
Claims priority, application France Mar. 5, 1973
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



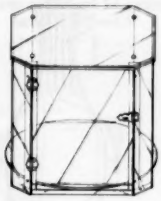
237,765
CHAIR
Denis Jester, Tiburon, and Matthew F. Callahan III, Corte Madera, Calif., assignors to Monastery Furniture Manufactory
Filed Oct. 24, 1973, Ser. No. 409,151
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

237,766
DISPLAY SUPPORT FOR PARALLELEPIPED PACKAGES
Amilcare Dogliotti, Neive, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy
Filed Apr. 22, 1974, Ser. No. 463,023
Claims priority, application Italy Nov. 5, 1973
Term of patent 14 years
Int. Cl. D6—*99*; D20—*02*
U.S. Cl. D6—85

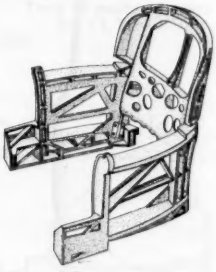


237,767
SOAP HOLDER
Horst Gruendler, 15230 Hackberry Lane, Brookfield, Wis. 53005
Filed May 20, 1974, Ser. No. 471,695
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—89

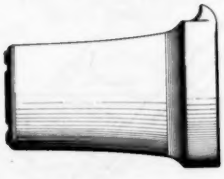
237,768
DISPLAY CASE
William R. Tipple, Cranston, R.I., assignor to Uncas Manufacturing Company, Providence, R.I.
Filed Dec. 6, 1973, Ser. No. 422,263
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—146



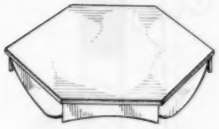
237,769
FURNITURE SUBFRAME
William R. Curtis, New Castle, and David C. Trimble, Yorklyn, Del., assignors to Hercules Incorporated, Wilmington, Del.
Continuation-in-part of design application Ser. No. 506,674, Sept. 17, 1974, which is a division of design application Ser. No. 455,773, Mar. 28, 1974. This application Sept. 27, 1974, Ser. No. 509,887
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



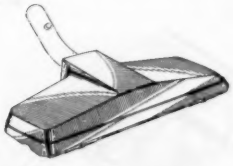
237,770
PITCHER
Robert Daenen, Erembodegem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 9, 1974, Ser. No. 432,024
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—59



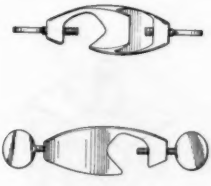
237,771
HOT DISH HOLDER
Trinidad B. Oropeza, 7222 E. Beverly Drive, Tucson, Ariz. 85710
Filed Oct. 1, 1973, Ser. No. 402,071
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—130



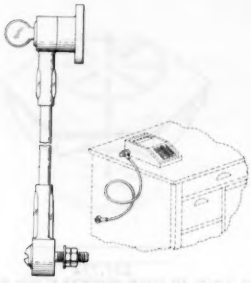
237,772
RUG AND FLOOR NOZZLE OR THE LIKE
Norman R. Batchelor, 110 Foster St. SE., North Canton, Ohio 44720
Filed Feb. 25, 1974, Ser. No. 445,057
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—173



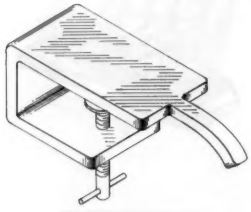
237,773
LABORATORY STAND CLAMP OR LIKE ARTICLE
Arthur F. Johnson, Northbrook, Ill., assignor to Humboldt Manufacturing Company, Norridge, Ill.
Filed Oct. 26, 1973, Ser. No. 409,928
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D8—72



237,774
SECURING DEVICE FOR PORTABLE OFFICE EQUIPMENT AND THE LIKE
Samuel M. Cannella, Pine Brook, N.J., assignor to Becker Tool Company, Inc., Paterson, N.J.
Filed May 15, 1974, Ser. No. 470,065
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—108

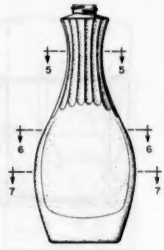


237,775
TIE-DOWN HOOK FOR PICKUP TRUCK
Kanji Hitomi, 1216 56th Ave., Sacramento, Calif. 95831
Filed June 12, 1974, Ser. No. 478,767
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229



237,776
BOTTLE
Edouard JB Aïassa, Neuilly-sur-Seine, France, assignor to Tradall, S. A., Geneva, Switzerland
Filed Aug. 3, 1973, Ser. No. 385,503
Claims priority, application Great Britain Feb. 16, 1973
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—72

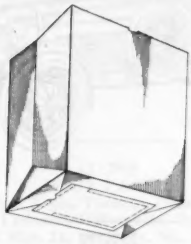
237,777
BOTTLE OR SIMILAR ARTICLE
John W. McDonald, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed May 10, 1974, Ser. No. 468,808
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—105



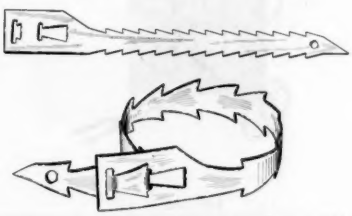
237,778
BOTTLE
Rene Lorgues, 5 Quai d'Anjou, Paris 4, France
Filed May 13, 1974, Ser. No. 469,338
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—159

237,779
DISPLAY CONTAINER FOR COOKIES
Nick Lucas, 2617 27th Ave. W., Seattle, Wash. 98199
Filed Dec. 14, 1973, Ser. No. 424,648
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—182

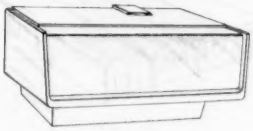
237,780
COMBINED BAG AND INFORMATION CONTAINING POCKET
Mitlon M. Bemel, Scottsdale, Ariz., assignor of a fractional part interest to Warren F. B. Lindsley, Phoenix, Ariz.
Continuation of design applications Ser. No. 220,551 and Ser. No. 220,553, both Jan. 24, 1972. This application Sept. 7, 1973, Ser. No. 395,162
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—249



237,781
FLEXIBLE STRAP FASTENER AND IDENTIFICATION BAND
Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205
Filed Mar. 1, 1974, Ser. No. 447,302
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—252



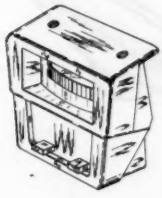
237,782
DIGITAL CLOCK HOUSING
Gordon T. Guth, Evanston, and Richard K. Thomas, Elk Grove Village, Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Sept. 4, 1973, Ser. No. 394,205
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



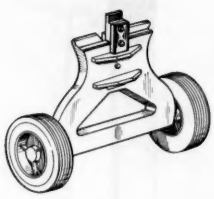
237,783
CLOCK
George R. Loubier, 92 Newbury St., Hartford, Conn. 06114
Filed July 11, 1974, Ser. No. 487,535
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—16

237,784
DIGITAL WRISTWATCH
Arthur Cruse, Dallas, Tex., assignor to E. Gluck Corporation, New York, N.Y.
Filed Aug. 16, 1974, Ser. No. 497,945
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

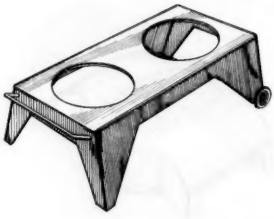
237,785
INSTRUMENT AND CONTROL HOUSING FOR A VEHICLE LEVELING SYSTEM
Robert W. Hegel, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.
Filed July 18, 1974, Ser. No. 489,757
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—46



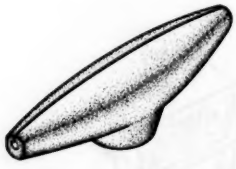
237,786
WHEELED CARRIER FOR BOATS
William James Gilster, 6800 Telegraph Road, Apt. 18, Birmingham, Mich. 48010
Filed Dec. 12, 1973, Ser. No. 423,890
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—32



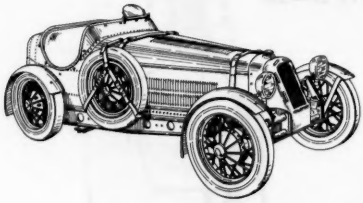
237,787
TRASH CAN CART
Victor L. Weyrich, Jr., Spearfish, S. Dak., assignor to Fibco Enterprises, Inc., Spearfish, S. Dak.
Filed May 31, 1974, Ser. No. 475,159
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—34



237,788
SAILBOAT SPREADER FENDER
Blair E. Howe, 2121 Union Ave, Costa Mesa, Calif. 92627, and Kenneth J. Booth, 912 Lantana, Brea, Calif. 92621
Filed May 6, 1974, Ser. No. 467,219
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—70

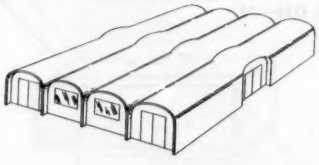


237,789
ANTIQUE CAR
Conrad K. Weiffenbach, 5483 Shimerville Road, Clarence, N.Y. 14031
Filed July 29, 1974, Ser. No. 492,787
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



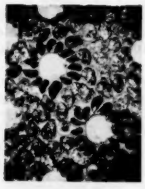
237,790
CARRIAGE FOR BICYCLES AND THE LIKE
Cynthia Adeline Z. Cone, Rt. 2, Box 363, Lubbock, Tex. 79415
Filed Sept. 30, 1974, Ser. No. 510,352
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114

237,791
MODULAR HOUSING STRUCTURE
Chester J. Quaife and George W. Robertson, both % 509 Imperial Bank Bldg., Edmonton, Alberta, Canada
Filed May 29, 1973, Ser. No. 364,429
Claims priority, application Canada Feb. 16, 1973
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R

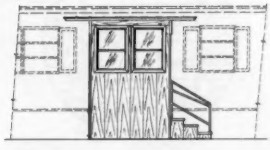


237,792
BUILDING
William C. Triplett, P.O. Box 276, Ingleside, Tex. 78362
Filed Mar. 22, 1974, Ser. No. 453,884
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 E

237,793
WALL PANEL
J. L. Marcel Begin, Toronto, Ontario, Canada
(115 Sexton Crescent, Willowdale, Ontario, Canada)
Filed Mar. 21, 1973, Ser. No. 343,226
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J

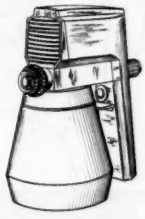


237,794
COMBINED MOBILE HOME PORCH AND STEPS
John Richardson, P.O. Box 291, Shattuck, Okla. 73858
Filed June 1, 1973, Ser. No. 366,196
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—7 R



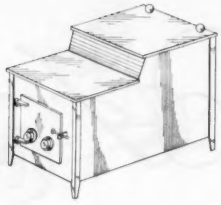
237,795
WATERING CAN
Jack Solomon, Island Park, N.Y., assignor to Pearl-Wick Corporation, Long Island City, N.Y.
Filed July 25, 1974, Ser. No. 491,849
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11

237,796
SPRAY GUN
Josef Wagner, Markdorferstr. 165, Friedrichshafen-Spallenstein, Germany
Filed Oct. 23, 1974, Ser. No. 517,041
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



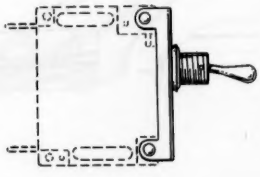
237,797
HANDLE FOR A TOILET SEAT OR THE LIKE
Milton A. S. Hermann, 1355 N. Sandberg Terrace, Apt. 902D, Chicago, Ill. 60610
Filed Oct. 30, 1974, Ser. No. 519,126
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

237,798
COMBINATION HEATING AND COOKING STOVE
Robert L. Fisher, Rte. 3, Box 283A, Springfield, Oreg. 97477
Filed May 16, 1974, Ser. No. 471,364
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—72

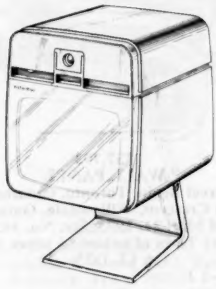


237,799
DATA PROCESSING CONSOLE
Ettore Sottsass, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Torino, Italy
Filed Oct. 5, 1972, Ser. No. 295,401
Claims priority, application Italy Apr. 24, 1972
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

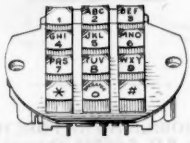
237,800
HANDLE ADAPTER FOR CIRCUIT BREAKERS
Ronald Nicol, Trenton, N.J., assignor to Heinemann Electric Company, Trenton, N.J.
Original design application Apr. 19, 1973, Ser. No. 352,712, now Patent No. 233,760, which is a division of design application Ser. No. 159,104, July 1, 1971, now Patent No. 227,903, which in turn is a continuation-in-part of design application Ser. No. 21,039, Jan. 22, 1970, Divided and this application Oct. 2, 1974, Ser. No. 511,482
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

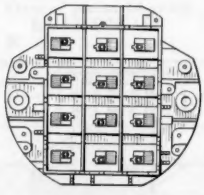


237,801
VIDEOTELEPHONE TRANSCEIVER
Donald Michael Genaro, Haworth, and Thomas Joseph Kelly, Middletown, N.J., John Niel McGarvey, Drexel Hill, Pa., and Daniel Wescoat Tyler, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 15, 1974, Ser. No. 514,401
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

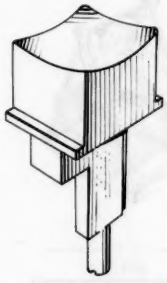


237,802
TELEPHONE PUSH-BUTTON DIAL
Gerhart F. Klaiber, Deal, and Donald Foggia, Oakhurst, N.J., assignors to TIE/Communications, Inc., Stamford, Conn.
Filed June 3, 1974, Ser. No. 475,851
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

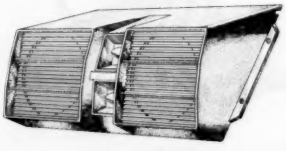




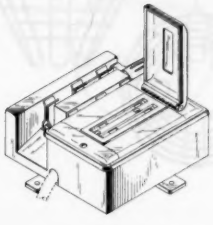
237,803
TELEPHONE DIAL BUTTON
Gerhart F. Klaiber, Deal, and Donald Foggia, Oakhurst, N.J., assignors to TIE/Communications, Inc., Stamford, Conn.
Filed June 3, 1974, Ser. No. 475,853
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



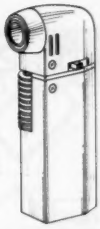
237,804
HOUSING FOR LOUDSPEAKERS
Hisashi Kizawa, % Kew Sonix Industries, Inc., Fudomae Mansion, 5–11–8 Nishigotanda, Shinagawa-ku, Tokyo, Japan
Filed Oct. 21, 1974, Ser. No. 516,630
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



237,805
ELECTRICAL OUTLET FOR ATTACHMENT TO THE ALTERNATOR OF AN AUTOMOBILE OR THE LIKE
Hollis R. Snodgrass, 601 S. Grinnell, Perryton, Tex. 79070
Filed Mar. 28, 1972, Ser. No. 239,011
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—15 A



237,806
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed May 10, 1974, Ser. No. 468,915
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

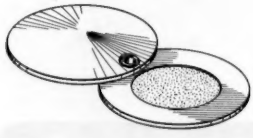


237,807
CIGAR TUBE
Maitlon T. Russell, Jr., Philadelphia, Pa., and Robert A. Serafini, North Tonawanda, N.Y., assignors to Bayuk Cigars Incorporated, Philadelphia, Pa.
Filed Jan. 15, 1973, Ser. No. 323,880
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D27—50

237,808
BALL GAME TARGET
Ernest W. Ekstrand, Long Beach, Calif. (12281 Ellen St., Garden Grove, Calif. 92640)
Filed May 10, 1974, Ser. No. 468,890
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 VV

237,809
GAME BOARD
James R. Becker, 6 Soundview Lane, Kings Point, N.Y. 11024, and Salvatore J. Villano, 8209 2nd Ave., North Bergen, N.J. 07047
Filed May 31, 1974, Ser. No. 475,290
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

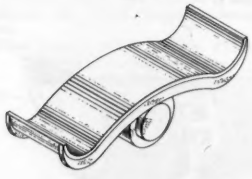
237,810
POCKET POOL CUE ABRADER
Don L. Turner, Morganfijoreg, Westfield, Wis. 53964
Filed July 1, 1974, Ser. No. 484,626
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BL



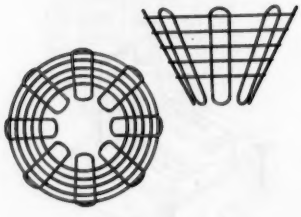
237,811
TOY CATAPULT
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316
Filed Feb. 13, 1974, Ser. No. 442,152
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP

237,812
TOY HORIZONTAL BAR
Kosei Kato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 5, 1974, Ser. No. 458,194
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

237,813
ROLLER BOARD
Will Clarke England, 7310 Eastcrest, Austin, Tex. 78752
Filed May 24, 1974, Ser. No. 473,935
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



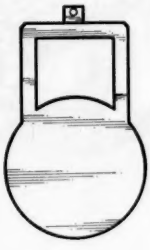
237,814
TREE BASKET OR THE LIKE
William L. Edmonds, Jr., Kenilworth, and Gerald P. Daley, Bensenville, Ill., and Leroy Den Besten, Castleton, N.Y., assignors to T. Equipment Sales Co.
Filed Dec. 13, 1974, Ser. No. 532,717
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D35—1



237,815
SERPENTINE WATCH BRACELET
Gianni Bulgari, Paolo Bulgari, and Nicola Bulgari, all of 10 Via Condotti, Rome, Italy
Filed May 10, 1974, Ser. No. 468,737
Claims priority, application Italy Nov. 12, 1973
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E

237,816
SERPENTINE RING
Gianni Bulgari, Paolo Bulgari, and Nicola Bulgari, all of 10 Via Condotti, Rome, Italy
Filed May 10, 1974, Ser. No. 468,739
Claims priority, application Italy Nov. 12, 1973
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 A

237,817
PENDANT
James L. Foreman, 801 Alamanda, Boca Raton, Fla. 33432
Filed June 27, 1973, Ser. No. 374,006
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—17

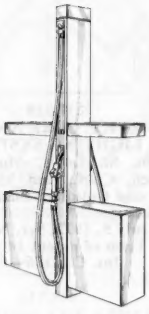


237,818
DECORATIVE FORM FOR HOLDING LIGHTS
Louis J. Vasku, 711 N. Bellevue Blvd., Bellevue, Nebr. 68005
Filed May 6, 1974, Ser. No. 467,068
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 A

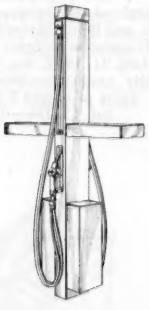
237,819
COMBINED SERVICE CORE AND FLUORESCENT LIGHTING SYSTEM
Murray L. Quin, St. Louis, Mo., Mitchell Bobrick, Redondo Beach, Calif., and Morris M. Buzan, St. Charles, Mo.; said Quin and Buzan assignors to Emerson Electric Co.
Filed July 5, 1973, Ser. No. 376,543
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 A

237,820
DISPENSING CONTAINER FOR PAPER TOWELS OR THE LIKE
Bengt Georg Hägglund, Brannappen, Tollered, S–440 04 Floda, Sweden, and Bengt Sigvard Göransson, Kungsor, Sweden; said Göransson assignor to said Hägglund
Filed Aug. 31, 1972, Ser. No. 285,430
Claims priority, application Sweden Mar. 1, 1972
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D52—2 C

237,821
LIQUID FUEL DISPENSING PUMP
Roy Frederick Gray, Maidenhead, England, assignor to Dresser Europe S.A., Brussels, Belgium
Filed Nov. 1, 1973, Ser. No. 411,859
Claims priority, application Great Britain May 3, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A

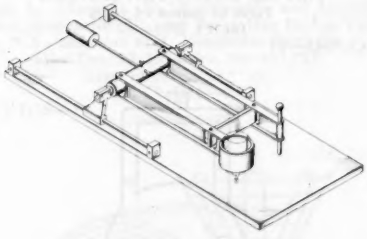


237,822
LIQUID FUEL DISPENSING PUMP
Roy Frederick Gray, Maidenhead, England, assignor to Dresser Europe S.A., Brussels, Belgium
Filed Nov. 1, 1973, Ser. No. 411,860
Claims priority, application Great Britain May 3, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A

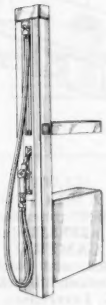


237,823
LIQUID FUEL DISPENSING PUMP
Roy Frederick Gray, Maidenhead, England, assignor to Dresser Europe S.A., Brussels, Belgium
Filed Nov. 1, 1973, Ser. No. 411,861
Claims priority, application Great Britain May 3, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A

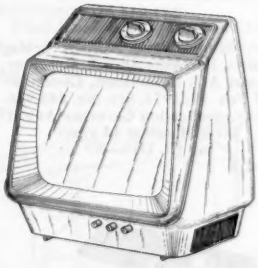
237,824
DUPLICATING CARVING MACHINE
Albert Kenneth Pagander, 4219 Linden Ave., Long Beach, Calif. 90807
Filed Aug. 3, 1973, Ser. No. 385,403
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 A



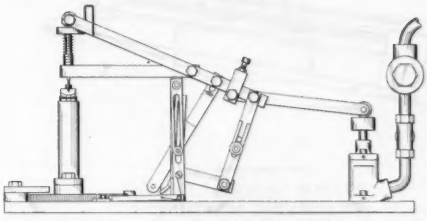
237,825
LIQUID FUEL DISPENSING PUMP
Roy Frederick Gray, Maidenhead, England, assignor to Dresser Europe S.A., Brussels, Belgium
Filed Nov. 1, 1973, Ser. No. 411,862
Claims priority, application Great Britain May 3, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A



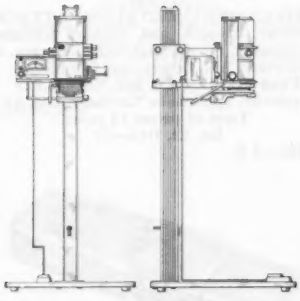
237,826
TELEVISION RECEIVER
John B. MacDonald, 4004 Oak Drive, and Richard J. Halstead, 2321 Drum Creek Road, both of Chesapeake, Va. 23321
Filed Apr. 27, 1973, Ser. No. 355,040
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D



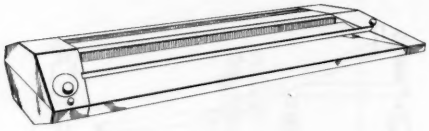
237,827
COIL-WINDING MACHINE
Lincoln Rogers, Caledonia, N.Y., assignor to Coil-Ler Manufacturing Co.
Filed Mar. 13, 1973, Ser. No. 340,817
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—14 R



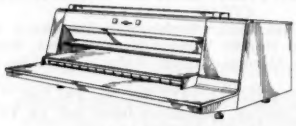
237,828
COMBINED PHOTOGRAPHIC ENLARGER AND COLOR ANALYZER
Masakazu Nakanishi, Hashimoto, Yoshiharu Hyodo, Aichi, and Haruki Yamaguchi, Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 17, 1974, Ser. No. 434,309
Claims priority, application Japan July 18, 1973
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



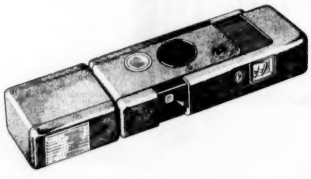
237,829
PHOTO COPY MACHINE
Jacques D. Donneux, Velroux, Belgium, assignor to Addressograph-Multigraph Corporation
Filed Apr. 1, 1974, Ser. No. 457,005
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



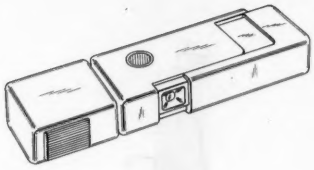
237,830
COPYING MACHINE
John James Van Acker, Chesterland, Ohio, and Jordan I. Rotheiser, Highland Park, Ill., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Aug. 12, 1974, Ser. No. 496,691
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



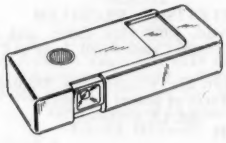
237,831
COMBINED CAMERA AND FLASH ATTACHMENT
Alfred Winkler, Munich, and Norbert Schlagheck and Herbert Schultes, Furstenfeldbruck, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany
Filed Feb. 19, 1974, Ser. No. 443,923
Claims priority, application Germany Aug. 17, 1973
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B



237,832
COMBINED CAMERA AND FLASH ATTACHMENT
Alfred Winkler, Munich, and Norbert Schlagheck and Herbert Schultes, Furstenfeldbruck, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany
Filed Feb. 19, 1974, Ser. No. 443,924
Claims priority, application Germany Aug. 17, 1973
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B

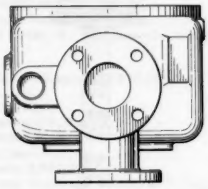


237,833
CAMERA
Alfred Winkler, Munich, and Norbert Schlagheck and Herbert Schultes, Furstenfeldbruck, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany
Filed Feb. 19, 1974, Ser. No. 443,925
Claims priority, application Germany Aug. 17, 1973
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61— 1 B



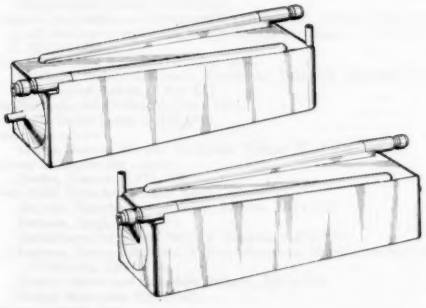
237,834
CAMERA
Alfred Winkler, Munich, and Norbert Schlagheck and Herbert Schultes, Furstenfeldbruck, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany
Filed Feb. 19, 1974, Ser. No. 443,926
Claims priority, application Germany Aug. 17, 1973
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B

237,835
PUMP CASING
Robert H. Bevan, Fayette, and Lawrence J. Cammuso, Seneca Falls, N.Y., assignors to Goulds Pumps, Inc., Seneca Falls, N.Y.
Filed Nov. 23, 1973, Ser. No. 418,380
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 R

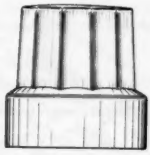


237,836
SUPPORT FOR A SCOOP
Harold R. Anderson, 7950 Wesley Drive, Minneapolis, Minn. 55427
Filed June 13, 1973, Ser. No. 369,712
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D67—3 B

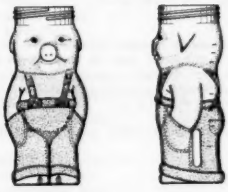
237,837
DIALYZER CARTRIDGE
William W. Cooper IV, Sudbury, Mass., assignor to the United States of America as represented by the Secretary of the Department of Health, Education, and Welfare, Washington, D.C.
Filed Jan. 23, 1973, Ser. No. 326,145
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F



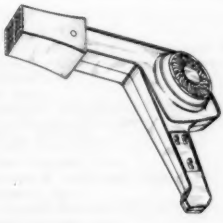
237,838
NURSING BOTTLE CLOSURE SHIELD
Paul Meeker, 412 Park, Kent, Ohio 44240
Filed May 8, 1974, Ser. No. 468,155
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D83—8 A



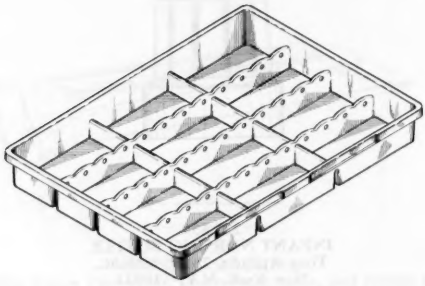
237,839
INFANT NURSING BOTTLE
Tony Apilado, 28 W. 89th St., New York, N.Y. 10024
Filed Jan. 23, 1975, Ser. No. 543,502
Term of patent 14 years
Int. Cl. D9—*01*; D24—*04*
U.S. Cl. D83—8 A



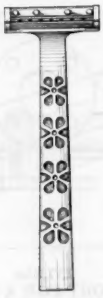
237,840
HAIR DRYER
Paul O. Rawson, 50 Sherwood Drive, Easton, Conn. 06612
Filed May 17, 1974, Ser. No. 470,887
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



237,841
COMPARTMENTED JEWELRY TRAY FOR PIERCED EARRINGS
Vincent Di Bartolo, Cresskill, N.J., assignor to Mele Manufacturing Co., Inc.
Filed Aug. 16, 1974, Ser. No. 498,085
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 B



237,842
RAZOR
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Jan. 23, 1974, Ser. No. 435,780
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



LIST OF PATENTEES

TO WHOM

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Tyslauk, Willy; and Bargel, Gunther, 3,922,016.

Barker, Richard H.; and Florentine, Frank P., to General Electric Company. Asbestos-free heat-resistant thermosettable phenol-aldehyde molding composition. 3,922,241, Cl. 260-17.200.

Barnes, Vernon M., Jr.; Gunn, Kenneth M.; and Slough, Carlton M., to Texaco Inc. System for monitoring the atmosphere in petroleum product tanks. 3,921,457, Cl. 73-421.50R.

Barnstedt, Egge: *See*—
Berg, Gerhard; Nordsiek, Karl-Heinz; and Barnstedt, Egge, 3,922,240.

Barnwell, George Derrick; and Peter, Reginald Charles, to Stratabord Limited. Dry wipe writing system and ink therefor. 3,922,457, Cl. 428-207.000.

Barr, Samuel Rothrock: *See*—
Nye, James Leroy; Barr, Samuel Rothrock; Chew, Thomas; and Steyer, William, 3,921,906.

Barradas, George. Hair curling implement. 3,921,648, Cl. 132-37.00R.

Barriball, Glenn. Fireplace safety and decorative closure device. 3,921,619, Cl. 126-140.000.

Barry Wright Corporation: *See*—
Dean, Carl J.; and Cournoyer, Bernard T., 3,921,798.

BASF Aktiengesellschaft: *See*—
Buchan, William A.; and Arns, Harold E., 3,922,610.
Rotter, Gerhard; Bleininger, Leonard S.; and Gertz, Robert L., 3,921,933.

BASF Wyandotte Corporation: *See*—
Narayan, Thirumurti L.; and Cenker, Moses, 3,922,238.
Otrhalek, Joseph V.; and Gansser, Robert E., 3,922,390.

Basile, Pietro. Automatic circuit restoration device for polyphase supply lines. 3,922,624, Cl. 335-26.000.

Bassous, Ernest, to International Business Machines Corporation. Nozzles formed in monocrystalline silicon. 3,921,916, Cl. 239-601.000.

Basu, Prithwis, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for removing roll film from cassettes. 3,921,278, Cl. 29-427.000.

Bateman, Charles Donald, to Sundstrand Data Control, Inc. Aircraft landing approach ground proximity warning system. 3,922,637, Cl. 340-27.00R.

Bates, David A.; Christopher, Gary L.; and Hall, George R., II, to Bailey Meter Company. Strip-chart recorder. 3,922,688, Cl. 346-136.000.

Bauer, Ronald J.: *See*—
Mracek, Milo F.; and Bauer, Ronald J., 3,921,234.

Baxter Laboratories, Inc.: *See*—
Dighe, Kamalakar D., 3,922,659.

Bayer Aktiengesellschaft: *See*—
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,922,324.

Bayer, John W., to Owens-Illinois, Inc. Composite laminate adhesively bonded with a hot melt composition. 3,922,469, Cl. 428-424.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Henning, Richard; and Schweiger, Erwin, 3,921,600.

Bayless, Robert G., to Capsulated Systems, Incorporated. Solid microglobules containing dispersed materials. 3,922,373, Cl. 426-576.000.

Baymiller, John W., to Armstrong Cork Company. Method and apparatus for bleaching furniture. 3,922,397, Cl. 427-254.000.

Bazant, Jan, heir: *See*—
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Bazant, Ondrej, heir: *See*—
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Bazant, Petr, heir: *See*—
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Bazant, Vladimir, deceased: *See*—
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Bazant, Vladimir, heir: *See*—
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Bazantova, Vera, heir: *See*—
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Bazarova, Klavdia Ivanovna: *See*—
Gorbatov, Vasily Matveevich; Sinitsin, Konstantin Dmitrievich; Krylova, Nina Nikolaevna; Lyaskovskaya, Julia Nazarovna; Volovinskaya, Valentina Pavlovna; Bazarova, Klavdia Ivanovna; Solovieva, Ljudmila Ivanovna; and Khlamova, Rimma Igorevna, 3,922,367.

BBC Brown, Boveri & Cie., AG: *See*—
Dandliker, Rene; and Mottier, Francois M., 3,922,093.

Bear, Fred B., to Victor Comptometer Corporation. Imitation feather fletching and method of making same. 3,922,401, Cl. 427-290.000.

Beasley, W. B. Rogers; Morehead, Jean; Pendleton, Elaine; and Schmidt, George, to Pathfinder Fund, The. Clinical demonstration model. 3,921,311, Cl. 35-17.000.

Beauchamp, Jesse L. Ion cyclotron resonance spectrometer and method. 3,922,543, Cl. 250-291.000.

Beaurain, Francis. Process for conditioning liquid. 3,921,367, Cl. 53-37.000.

Beaver, Robert I., II: *See*—
Roberson, Glenn A., Jr.; Beaver, Robert I., II; and Kelly, Edward L., 3,921,788.

Beck, Gerald H., to Parker-Hannifin Corporation. Combination fluid seal and rod wiper. 3,921,991, Cl. 277-205.000.

Becker, Karl-Heinz: *See*—
Pohlke, Rolf; Mehrhof, Werner; Becker, Karl-Heinz; Schliep, Hans-Jochen; Nowak, Herbert; and Simane, Zdenek, 3,922,261.

Becton, Dickinson and Company: *See—*
Adams, Thomas B., 3,921,369.

Begey, Jean-Marie; and Neau, Alain, to Mitchell S.A. Ski binding adjustment device. 3,921,997, Cl. 280-11.35T.

Behrendt, Bernhard: *See—*
Alf, Herbert; and Behrendt, Bernhard, 3,922,010.

Bell, Reuben H.; and Foley, Kevin M., to Owens-Corning Fiberglas Corporation. Silanes useful as coupling agents and flame retardants. 3,922,436, Cl. 428-375.000.

Bell, Reuben H.; and Foley, Kevin M., to Owens-Corning Fiberglas Corporation. Silane coupling agents. 3,922,466, Cl. 428-388.000.

Bell, Richard J.; Wynn, John D.; Denton, George T.; Sand, Ralph E.; and Cornelius, David L., Jr., to Anderson, Clayton & Co. Preparation of simulated cheese. 3,922,374, Cl. 426-582.000.

Bell Telephone Laboratories, Incorporated: *See—*
Aul, Guy Darrell; Ballard, James Russell; and Fraser, Roger Alan, 3,922,498.
Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wernick, Jack Harry, 3,922,553.
Boyd, Gary Delane; and Coldren, Larry Allen, 3,922,622.
Donohoe, Douglas Carroll, 3,922,495.
Fuchs, Edward Oscar; and Swisher, James Howe, 3,922,180.
Glass, Alastair Malcolm; and von der Linde, Dietrich, 3,922,061.
Smith, George Elwood, 3,922,571.
Thompson, John Stewart, 3,922,619.

Bely, Igor Vasilievich; Gorkin, Leonid Davidovich; Dmitriev, Valery Sergeevich; Khvorost, Vladimir Jurievich; Khimenko, Lev Timofeevich; and Mezhuev, Alexandr Tikhonovich. Inductor for magnetic-pulse stamping of flat banks. 3,921,426, Cl. 72-56.000.

Bemm, Robert A. Automatic confection decorating system. 3,921,858, Cl. 222-146.0HE.

Benatti, Vincenzo: *See—*
Caccia, Angelo; and Benatti, Vincenzo, 3,921,689.

Bender Machine Works, Inc.: *See—*
Schmid, Rolyn A., 3,921,652.

Bendix Corporation, The: *See—*
Harper, Patrick D.; Knight, Theodore L.; Slavin, Michael; and Ingels, Ward A., 3,922,658.
Rosback, Richard H., 3,921,501.
Shaw, Benjamin Chandler; and Crookshanks, Rex John, 3,922,670.
Thakore, Kaushik H., 3,922,604.

Beneke Division, Beatrice Foods Co.: *See—*
O'Neil, Robert A., 3,921,235.

Benham, George K., to Allis-Chalmers Corporation. Resistor switch synchronizing operating mechanism. 3,922,512, Cl. 200-148.00F.

Benisek, Edward F., to Wallace Murray Corporation. Pre-whirl turbo charger apparatus. 3,922,108, Cl. 415-116.000.

Bennie, Annette; and Reed, Norman Leonard, to Bespak Industries Limited. Inhaler for powdered medicament. 3,921,637, Cl. 128-266.000.

Benoit, Robert; and Mairet, Andre. Wheelchair with detachable drive means. 3,921,744, Cl. 180-13.000.

Bensdorp International B.V.: *See—*
Bensdorp, Josef Ernst Marie, 3,922,130.

Bensdorp, Josef Ernst Marie, to Bensdorp International B.V. Apparatus for producing barky chocolate. 3,922,130, Cl. 425-223.000.

Bentz, Erwin J. H.; Getz, Marvin G.; and Stapf, Roger A., to Caterpillar Tractor Co. Centrifugal fan cooling system. 3,921,603, Cl. 123-41.330.

Beranek, Jaroslav; Bazant, Vladimir, deceased; by Bazantova, Vera, heir; by Bazant, Petr, heir; by Bazant, Ondrej, heir; by Bazant, Jan, heir; by Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, to Ceskoslovenska akademie ved. Cap for inlet of fluid into a fluidized bed. 3,921,663, Cl. 137-533.110.

Berg, Gerhard; Nordsiek, Karl-Heinz; and Barnstedt, Egge, to Chemische Werke Huels Aktiengesellschaft. Process for the production of pourable, pulverulent rubber-filler mixtures. 3,922,240, Cl. 260-17.00R.

Berger, Barry David, to Thomson-Leeds, Company, Inc. Shelf support structure. 3,921,539, Cl. 108-8.000.

Berger, Horst H.; and Wiedmann, Siegfried K., to International Business Machines Corporation. Monolithically integrable digital basic circuit. 3,922,565, Cl. 307-213.000.

Bergfjord, John Alf; Grammatica, Steven James; and Radler, Richard William, to Xerox Corporation. Photoelectric and electrophotographic pigments comprising derivatives of condensed polycyclic aromatic hydrocarbon aldehydes. 3,922,169, Cl. 96-1.0PE.

Berghmans, Elie Francois: *See—*
Walon, Raoul Guillaume Philippe; and Berghmans, Elie Francois, 3,922,200.

Bergmark, Nils Randolf; and Johansson, Karl-Gunnar Torbjorn, to Futurumverken AB. Fire damper device. 3,921,657, Cl. 137-75.000.

Berkey Photo, Inc.: *See—*
Nesson, Israel; and Graham, Thomas G., 3,922,690.

Bernotavicz, John W., to Quaker Oats Company, The. Shelf stable, high moisture, filled food product. 3,922,353, Cl. 426-94.000.

Bertin, Jacques, to Paulstra. Seals notably for rotary shafts. 3,921,992, Cl. 277-237.000.

Bespak Industries Limited: *See—*
Bennie, Annette; and Reed, Norman Leonard, 3,921,637.

Bethlehem Steel Corporation: *See—*
Wheeler, James E., 3,921,838.

Bettoli, Phillip S., to GAF Corporation. Composite shingle. 3,921,358, Cl. 52-314.000.

Bevan, Howard Lynne: *See—*
Tseung, Alfred Chan Chung; and Bevan, Howard Lynne, 3,922,204.

Beynon, John David Emrys; Newell, Alan Francis; Maddock, Robert John; and Stevenson, Robert Andrew, to General Electric Company Limited, The. Repertory dialler with variable length circulating store. 3,922,646, Cl. 340-173.0RC.

Beynon, John O., to Preston Metal and Roofing Products Limited. Cross member with end connector. 3,921,363, Cl. 52-758.00A.

Biddle, William P.; and Tacker, John J., to Athens Stove Works, Inc. Gas range top burner. 3,922,138, Cl. 431-193.000.

Billottet, Henri: *See—*
Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, 3,922,636.

Binczyk, Franciszek: *See—*
Gierek, Adam; Binczyk, Franciszek; and Kowalski, Andrzej, 3,922,211.

Biondetti, Mario, to Escher Wyss Limited. Rolling mill. 3,921,514, Cl. 100-162.00B.

Bird Island, Inc.: *See—*
Wildhaber, Ernest, 3,921,566.
Wildhaber, Ernest; and Chapman, Howard G., 3,921,567.

Birnbaum, Jerome: *See—*
Hallada, Thomas C.; Inamine, Edward; and Birnbaum, Jerome, 3,922,202.

Birt, Thomas W.; Sweany, Louis P.; and Pirtle, James D., to P. R. Mallory & Co., Inc. Audible alarm device. 3,922,672, Cl. 340-384.00E.

Bischoff, Lothar: *See—*
Rebmann, Manfred; Rittler, Roland; Bischoff, Lothar; and Moser, Theo, 3,921,681.

Bishop, Walton B., to United States of America, Navy. IFF interrogator identification system. 3,922,673, Cl. 343-6.5LC.

Bitumarin N.V.: *See—*
Reintjes, Rudolf Carlo; and Hollander, Albert, 3,922,417.

Bjorhaag, Georg. Sliding mould for concrete piles including slipform and rollers. 3,922,124, Cl. 425-64.000.

Bjork, Harold John Carl; and Caroc, Torben Erik, to Telefonaktiebolaget LM Ericsson. Telecommunication plant in which a wide-band channel if wanted is connected by the side of a telephone connection. 3,922,491, Cl. 179-2.0TV.

Black, Sivalls & Bryson, Inc.: *See—*
Wood, Loren E.; and Reynolds, John W., 3,921,556.

Black, William R., Sr. Window guard apparatus. 3,921,334, Cl. 49-56.000.

Blair, E. J.: *See—*
Killion, Leonard H.; and Blair, E. J., 3,921,707.

Blankenship, Ernest Bayne, to Research Products/Incinolet Corporation. Catalyst container in incinerator toilet. 3,921,227, Cl. 4-131.000.

Blasco, Richard William: *See—*
Hampel, Daniel; and Blasco, Richard William, 3,922,536.

Bledsoe, James O., Jr.: *See—*
Derfer, John M.; and Bledsoe, James O., Jr., 3,922,308.

Bleininger, Leonard S.: *See—*
Rotter, Gerhard; Bleininger, Leonard S.; and Gertz, Robert L., 3,921,933.

Blevins, Terrence L., to Western Electric Company, Inc. Snap-on electrical connector. 3,922,052, Cl. 339-19.000.

Blok, Simon, to Laura & Vereeniging N.V. Lateral roll suspension. 3,921,951, Cl. 248-373.000.

Bloom, Gerald: *See—*
Masnik, Walter; and Bloom, Gerald, 3,921,448.

Blumenthal, Gunter, to Bochumer Eisenhutte Heintzmann & Co. Support for the roof of an excavation. 3,921,409, Cl. 61-45.00D.

Blunt, Harry W.; and Repka, Benjamin C., to Hercules Incorporated. Preparation of fibrous copolymers of propylene and ethylene. 3,922,257, Cl. 260-88.200.

BMR Security Products Corporation: *See—*
Walters, Russell W., 3,921,422.

Bochumer Eisenhutte Heintzmann & Co.: *See—*
Blumenthal, Gunter, 3,921,409.

Boeing Company, The: *See—*
Lettini, Michael J.; and Stock, Howard P., 3,922,050.

Boetto, Charles: *See—*
Connor, Donald E.; and Boetto, Charles, 3,921,726.

Bok, Hendrik Frederik; and St. Onge, Eugene Raymond, to In-Line Technology. Method of conveying round wafers. 3,921,796, Cl. 198-266.000.

Bolex International SA: *See—*
Thevenaz, Jean A., 3,922,077.

Bolger, Bernard J., to Loctite (Ireland), Limited. Interfitting threaded part and process of preparing same. 3,922,449, Cl. 428-542.000.

Bolli, Hans. Paving slab having spot glued blocks. 3,922,105, Cl. 404-34.000.

Bolton, Theodore S.: *See—*
Murnane, Raymond J.; and Bolton, Theodore S., 3,921,416.

Bond, John H.: *See—*
Hickey, Richard C.; Bond, John H.; and Watson, Tandy P., 3,921,969.

Borbas, Robert A.; Dufton, John P.; and Foster, James H., to GTE Automatic Electric (Canada) Limited. Scan operation for a central processor. 3,922,644, Cl. 340-172.500.

Borbolla, Lorenzo, Jr.: *See—*
Heath, Stephen D.; and Borbolla, Lorenzo, Jr., 3,921,412.

Borges, Alfred Richard. Selectable and height adjustable hitch. 3,922,006, Cl. 280-415.00A.

Borgman, Milton H.: *See—*
Trieunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,921,380.
Bornfleth, Ulrich; and Selonke, Fritz, to Hauni-Werke Korber & Co. KG. Conveyor system for sidewise transport of cigarettes or the like along arcuate paths. 3,921,791, Cl. 198-165.000.
Boswell, Robert Frederick, Jr.: *See—*
Duncan, Robert Louis, Jr.; and Boswell, Robert Frederick, Jr., 3,922,276.
Botalam: *See—*
Glasson, Jean Emile, 3,921,510.
Botnick, Irlin H. Pressure balancing valve. 3,921,658, Cl. 137-98.000.
Bottasso, Franco; and Facciarini, Antonio, to Industrie Pirelli S.p.A. Apparatus for molding an embossed pattern on the peripheral band of a toroidal article, in particular on tire treads. 3,922,122, Cl. 425-46.000.
Bottum, Charles F., to White, Lyle E., a part interest. Oil drain pump assembly for internal combustion engines. 3,921,759, Cl. 184-1.500.
Bourgraf, Elroy E.; Self, Kenneth R.; and Dunn, Robert E., to Ferno-Washington, Inc. Combination adjustable break-away scoop stretcher and extrication device. 3,921,231, Cl. 5-82.000.
Bourree, Rene; and Brin, Michel, to Groupment pour les Activities Atomiques et Avancees "GAAA". Movement compensating apparatus for floating drilling. 3,921,823, Cl. 214-2.500.
Bous, Karl: *See—*
Rosenkranz, Dieter; Bous, Karl; Schmidt, Roland; Engelhardt, Werner; and Vermehren, Gunter, 3,921,419.
Bowden, Ronald Percy: *See—*
Coe, George Harold; and Bowden, Ronald Percy, 3,922,115.
Bowles, Arnold G.: *See—*
Witkin, Donald E.; and Bowles, Arnold G., 3,922,527.
Boyadjieff, George I.; and Campbell, Andrew B., to Varco International, Inc. Tool for making and breaking pipe joints. 3,921,473, Cl. 81-57.340.
Boyd, Gary Delane; and Coldren, Larry Allen, to Bell Telephone Laboratories, Incorporated. Elastic waveguide utilizing an enclosed core member. 3,922,622, Cl. 333-30.00R.
Brachmanski, Eugeniusz: *See—*
Wyslouch, Zenon; and Brachmanski, Eugeniusz, 3,921,836.
Bracka, Bruno W., to General Dynamics Corporation. Rudder boundary layer control device. 3,921,942, Cl. 244-87.000.
Bracken, Joseph W., Jr., to Eaton Corporation. Screw thread fuel slinger. 3,921,393, Cl. 60-39.74S.
Bradley, Wilson E., Jr.: *See—*
Engalitcheff, John, Jr.; Bradley, Wilson E., Jr.; and Schinner, Edward N., 3,922,153.
Brady, Brian B., to Magnetic Controls Company. Coded telephone line testing equipment. 3,922,508, Cl. 179-175.30R.
Brandenberger, Ernst, to Kubatec Kunststoff- und Bautechnik AG. Oxygen supplied thermal lance. 3,921,542, Cl. 110-1.00R.
Braun, Josef; Hartmann, Manfred; and Oesterle, Helmut, to Hilti Aktiengesellschaft. Fastening member for an explosive powder charge operated setting tool. 3,921,495, Cl. 85-10.00E.
Brenig, Theodore; and Gordon, Robert T., to General Electric Company. Communication system using time-division multiplexing and pulse-code modulation. 3,922,493, Cl. 179-15.0AP.
Brenner, Lothar P., to Ygnis S.A. Heat exchanger and method of operation thereof. 3,921,708, Cl. 165-84.000.
Brevetti C.E.A. S.p.A.: *See—*
Ziche, Arrigo, 3,921,895.
Brewer, Andrew I., to Star-Kist Foods, Inc. Fragrant animal litter and additives therefor. 3,921,581, Cl. 119-1.000.
Brewer, Lloyd A.: *See—*
Baker, Donald C.; Brewer, Lloyd A.; and Maurer, Herman J., 3,921,835.
Brichard, Edgard; and Lambert, Michel, to Glaverbel S.A. Secretariat Technique. Multiple-pane glazings. 3,921,359, Cl. 52-616.000.
Bridgeford, Douglas J.; and McNeil, Frank M., to Tee-Pak, Inc. Method for forming fibrous sausage casings. 3,922,398, Cl. 427-259.000.
Bridgestone Tire Company Limited: *See—*
Suzuki, Yasuo; Arimura, Iwao; and Matsuda, Akira, 3,921,693.
Bright, James A., to General Motors Corporation. Water fill arrangement for clear cube ice maker. 3,921,414, Cl. 62-188.000.
Bright, Ralph W. Tubular rail and post fencing. 3,921,960, Cl. 256-65.000.
Bright, Robert H., to Koppers Company, Inc. Quencher car spotting interlock. 3,921,830, Cl. 214-23.000.
Briles, Franklin S. Fastener with tapered shank and dual tapered head. 3,921,364, Cl. 52-758.00F.
Brin, Michel: *See—*
Bourree, Rene; and Brin, Michel, 3,921,823.
Brink, Jack, to All American Maintenance, Inc. Tennis ball sealing and inflation means. 3,921,977, Cl. 273-61.00D.
British Minister of Defence: *See—*
Cooper, Gordon Arthur; Goddard, Kenneth Douglas; and Lowe, Gordon Campbell, 3,922,494.
British Petroleum Company Limited, The: *See—*
Wanless, Gordon James, 3,922,218.
British Steel Corporation: *See—*
Reed, Geoffrey Ronald; and Knox, Barry Edward, 3,921,803.
Brocard, Huguette. Machine for destroying documents. 3,921,920, Cl. 241-159.000.
Brockelsby, Norman D.; and Haase, Reinhold A., to Dutton-Lainson Company. Tongue jack. 3,921,958, Cl. 254-86.00R.
Brockington, James W., to Texaco Inc. Isoparaffin-olefin alkylation utilizing fluorosulfonic acid and sulfuric acid catalyst. 3,922,319, Cl. 260-683.630.
Broeker, Bernard D., Jr., to Motorola, Inc. External exclusive OR type circuit for inverting cell MOS RAM. 3,922,647, Cl. 340-173.00R.
Broemer, Heinz; Kaes, Hans-Herbert; and Pfeil, Emanuel, to Ernst Leitz G.m.b.H. Process of making biocompatible glass ceramic. 3,922,155, Cl. 65-33.000.
Broken Hill Proprietary Company Limited, The: *See—*
Marek, Jiri Frantisek; Evans, Bruce Ronald; and Callcott, Thomas George, 3,921,307.
Broughton, Stanley A.; and Guenther, Dennis K. Auxiliary attachment for snowmobiles. 3,921,998, Cl. 280-19.000.
Brown, Albert E.; Schlotzhauer, Allan T.; and Newman, Douglas A., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Supercoated transfer elements and process for preparing and using same. 3,922,438, Cl. 428-411.000.
Brown, Archer W., deceased (by Brown, Inell B., administratrix); and DeCuir, Talford S., to American Hoist & Derrick Company. Crane with a suspended rotatable counterbalance. 3,921,815, Cl. 212-3.000.
Brown, Clifford Gordon, to United States Borax & Chemical Corporation. Cold-pressed refractory materials. 3,922,474, Cl. 428-457.000.
Brown, Douglas Arthur; and Garden, William David, to Imperial Chemical Industries Limited. Process for coating a substrate with a polysiloxane composition. 3,922,443, Cl. 428-447.000.
Brown, Harold J., to Lorain Products Corporation. Control system for phase displacement regulator circuits. 3,922,594, Cl. 321-5.000.
Brown, Inell B., administratrix: *See—*
Brown, Archer W., deceased; and DeCuir, Talford S., 3,921,815.
Brown, Leanne M.: *See—*
Mazdiyasni, Khodabakhsh S.; and Brown, Leanne M., 3,922,333.
Brown & Sharpe Manufacturing Company: *See—*
Ingham, John Milton; and Reslow, Lloyd Frederick, 3,921,993.
Brownrigg, Richard T., to Houdaille Industries, Inc. Modular divisional feeder. 3,921,760, Cl. 184-7.00E.
Bruderlein, Francois T.; and Humber, Leslie G., to Ayerst McKenna and Harrison Ltd. Benzocycloheptaisoquinoline derivatives III in producing CNS depressant effects. 3,922,346, Cl. 424-258.000.
Brumlik, George C., to Ingrip Fasteners, Inc. Asymmetrical self-gripping device. 3,921,258, Cl. 24-204.000.
Brumlik, George C., to Ingrip Fasteners, Inc. Self-gripping device with composite gripping elements. 3,921,259, Cl. 24-204.000.
Brumlik, George C., to Ingrip Fasteners, Inc. Linear element with grafted nibs and method therefor. 3,922,455, Cl. 428-85.000.
Bruninga, Kenneth J.: *See—*
Hayes, Jerry R.; and Bruninga, Kenneth J., 3,921,910.
Brunner, Rolf H.; Carbone, Quiedo J.; and Lester, William C., to International Business Machines Corporation. Vacuum coating apparatus. 3,921,572, Cl. 118-49.100.
Brunner, Russell K.: *See—*
Halfhill, Martin O.; and Brunner, Russell K., 3,922,718.
Brunswick Corporation: *See—*
Miller, Arthur F.; and Schmiedel, Robert C., 3,921,569.
Bryceland, Maurice Cyril, to Waldman Corporation. Rotary switches. 3,922,509, Cl. 200-11.00R.
Bucalo, Louis, to Kinemotive Corporation. Assemblies of precision-fitted relatively movable components. 3,922,044, Cl. 308-237.000.
Buchan, William A.; and Arns, Harold E., to BASF Aktiengesellschaft. Pulse anti coincidence methods and circuits. 3,922,610, Cl. 328-109.000.
Bucherl, Erwin, to Siemens Aktiengesellschaft. Electrical filter with a nyquist flank characteristic. 3,922,623, Cl. 333-70.00R.
Bucholtz, Glen E.; and Finegold, Hyman B., to Globe Tool and Engineering Company, The. Armature winding method and machine. 3,921,284, Cl. 29-597.000.
Buckley, William D., to Energy Conversion Devices, Inc. Method and means for preventing degradation of threshold voltage of filament-forming memory semiconductor device. 3,922,648, Cl. 340-173.00R.
Bud Antle, Inc.: *See—*
Pierce, Frank D., 3,922,362.
Buehler, Ernest: *See—*
Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wernick, Jack Harry, 3,922,553.
Buell, Clarence E., Jr. Gas cylinder carrier. 3,921,872, Cl. 224-45.00R.
Bulten-Kanthal Aktiebolag: *See—*
Svensson, Stig; and Lindgren, Stig, 3,922,028.
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; Kondo, Katsumi; Morita, Akiyoshi; Koyama, Mototsugu; Sato, Mitsuyoshi; and Miyazaki, Shoji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyst for purifying exhaust gas by removing nitrogen oxides and a process for the manufacture thereof. 3,922,234, Cl. 252-455.00R.
Bundschuh, Robert L., to Mitsui Mining & Smelting Co., Ltd. Occupant-propelled vehicle and drive system therefor. 3,922,005, Cl. 280-237.000.
Bundy, Albert J., to ASG Industries, Inc. Support structure for transporting uncrated lading. 3,921,538, Cl. 105-367.000.
Bunker-Ramo Corporation, The: *See—*
Leone, Anselm James, 3,921,383.
Older, Robert B.; and Smith, Charles W., 3,922,479.
Burgen, Robert Walter: *See—*
McGuffin, William George; and Burgen, Robert Walter, 3,922,593.
Burgess, Ralph D., Jr. Moving gate discharge system. 3,921,853, Cl. 222-1.000.

Burke, Oliver W., Jr.; and Hunt, Barbara P., to Burke, Oliver W., Jr. Fiber-elastomer laminates utilizing an unresinified m-aminophenol primer. 3,922,468, Cl. 428-414.000.

Burkhardt, David J.; and Splittstoesser, Clair D., to Outboard Marine Corporation. Bogie suspension system. 3,922,024, Cl. 305-27.000.

Burkhardt, Lawrence E.; and Manns, Basil H., to United States of America, Navy. Electrical trip wire switch. 3,921,530, Cl. 102-70.20R.

Burkhartsmeier, Gary L., to United States of America, Navy. Multiple chromatographic column system. 3,922,223, Cl. 210-198.00C.

Burns, Donald A., to Technicon Instruments Corporation. Method and apparatus for selectively removing immiscible fluid segments from a fluid sample stream. 3,921,439, Cl. 73-61.10R.

Burns, Donald Anthony, to Cementation Chemicals Limited. Capsule for use in fixing rock-bolts. 3,921,800, Cl. 206-219.000.

Burns, Michael P. H., to Watford Engineering Limited. Apparatus for treating slurries. 3,921,512, Cl. 100-117.000.

Burton, John S.; and Whitney, Ronald L., to Terminal Data Corporation. Controlled document recording system. 3,922,084, Cl. 355-41.000.

Butler Industries, Inc.: *See—*
Cimino, Alfonse, 3,921,813.

Butt, Sheldon H.: *See—*
Ford, James A.; and Butt, Sheldon H., 3,921,886.

Buttimore, David, to May & Baker Limited. Isothiazole derivatives. 3,922,160, Cl. 71-90.000.

Buxton, Aldon L.; Donnerstag, Leonard; and Gryctko, Carl E., to I-T-E Imperial Corporation. Ground fault detecting power outlet. 3,922,586, Cl. 317-112.000.

Byer, Robert L.; and Herbst, Richard L., to Leland Stanford Junior University, The Board of Trustees of the. Tunable electromagnetic oscillator using {01.4} grown $linbo_3$ and method. 3,922,561, Cl. 307-88.300.

Byron Jackson Inc.: *See—*
Giebeler, Ben F., 3,922,009.

C. D. Sparling Co.: *See—*
Klein, Kenneth H., 3,921,236.

C. G. Doris (Compagnie Generale pour les Developments Operationnels des Richesses): *See—*
Lamy, Jacques Edouard, 3,921,408.

Cabot Corporation: *See—*
Jordan, Merrill E.; and Morgan, Allan C., 3,922,335.

Caccia, Angelo; and Benatti, Vincenzo, to Industrie Pirelli S.p.A. Safety tire with a sealing action and an anti-burst action. 3,921,689, Cl. 152-347.000.

Cacciotti, Peter J.: *See—*
Holub, Fred R.; Cacciotti, Peter J.; and Pauze, Denis R., 3,922,252.

Calavetta, Anthony. Body-carried medical history card. 3,921,318, Cl. 40-2.200.

Calcagno, Bendetto: *See—*
Cocuzza, Gioacchino; Montoro, Italo; and Calcagno, Bendetto, 3,922,314.

Caletti, Robert H.; Martin, Timothy W.; and Swain, Ronald L., to Information Storage Systems, Inc. Carriage assembly for a magnetic disc storage drive. 3,922,720, Cl. 360-106.000.

Callcott, Thomas George: *See—*
Marek, Jiri Frantisek; Evans, Bruce Ronald; and Callcott, Thomas George, 3,921,307.

Calmes, Jean Paul, to Innocenti Santeustacchio S.p.A. Apparatus for rolling seamless tubes. 3,921,430, Cl. 72-201.000.

Calspan Corporation: *See—*
Weatherston, Roger C., 3,922,117.

Calvin, Guy Edmond; and Costecalde, Andre Marcel, to Saunier Duval. Arrangement and mounting of the enclosure and combustion chamber of a forced-draft boiler. 3,921,592, Cl. 122-262.000.

Calx, Inc.: *See—*
McDonough, Thomas L.; and McDonough, Martin M., 3,921,884.

Camp, Harold E.; and Grier, John D., to Owens-Illinois, Inc. Data handling system with rotatable fiber optic shutter. 3,922,645, Cl. 340-173.0PL.

Camp, Richard H. Combination carrier and latch. 3,921,870, Cl. 224-42.070.

Campbell, Andrew B.: *See—*
Boyadjieff, George I.; and Campbell, Andrew B., 3,921,473.

Campbell, Donn V., to United States of America, Army. Wide band radio-frequency phase sensor. 3,922,679, Cl. 343-703.000.

Campbell, Floyd R. Motorcycle carrier attachment for wheeled vehicle. 3,921,842, Cl. 214-450.000.

Campbell, James B. Ski clamping apparatus. 3,921,967, Cl. 269-43.000.

Campbell, John Stewart; Craven, Patrick; and Davies, Phineas, to Imperial Chemical Industries Limited. Hydrogen. 3,922,337, Cl. 423-656.000.

Canadian Industries Ltd.: *See—*
McKee, James Glen, 3,921,529.

Canon Kabushiki Kaisha: *See—*
Kishimoto, Juji; and Mikada, Hiroyuki, 3,922,668.
Kunishima, Toshiaki, 3,921,782.
Uchidoi, Masanori; and Shigeta, Yoshihiro, 3,922,078.
Uchidoi, Masanori; and Yamada, Tateo, 3,922,081.

Capsulated Systems, Incorporated: *See—*
Bayless, Robert G., 3,922,373.

Capy, Marcel, to Compagnie Europeenne pour l'Equipement Menager, CEPEM. Gas burner having lateral openings and a device for deflecting the flames upwards. 3,921,913, Cl. 239-553.000.

Carabateas, Philip M., to Sterling Drug Inc. 4-(3-Nitrophenyl)-3,5-pyridinedicarboxylic acid. 3,922,278, Cl. 260-295.50R.

Carbone, Quiedo J.: *See—*
Brunner, Rolf H.; Carbone, Quiedo J.; and Lester, William C., 3,921,572.

Carlin, William W.; and Darlington, William B., to PPG Industries, Inc. Process for the recovery of fission products from waste solutions utilizing controlled cathodic potential electrolysis. 3,922,231, Cl. 252-301.10W.

Carnes, W. Robert; Balogh, John J., Jr.; and Selnick, Lester L., to Pitney-Bowes, Inc. Improved circuit for detecting the passage of an article beating a repetitive marking. 3,922,539, Cl. 235-183.000.

Carnes, W. Robert, Jr., to Pitney-Bowes, Inc. High speed printer. 3,921,518, Cl. 101-111.000.

Carnes, W. Robert, Jr., to Pitney-Bowes, Inc. Apparatus for the optical examination of articles. 3,922,557, Cl. 250-578.000.

Caroc, Torben Erik: *See—*
Bjork, Harold John Carl; and Caroc, Torben Erik, 3,922,491.

Caroglio, Mario, to Montedison Fibre S.p.A. Device for the texturization of synthetic thermoplastic continuous fibers. 3,921,268, Cl. 28-1.800.

Caron Compactor Co.: *See—*
Caron, Fred Joseph; and Caron, James Oliver, 3,922,106.

Caron, Fred Joseph; and Caron, James Oliver, to Caron Compactor Co. Compaction wheel with traction and crushing characteristics. 3,922,106, Cl. 404-121.000.

Caron, James Oliver: *See—*
Caron, Fred Joseph; and Caron, James Oliver, 3,922,106.

Carr, Eric; and McClave, Kenneth, to Lucas Aerospace Limited. Flame tube shroud assembly for fuel injector nozzle. 3,921,392, Cl. 60-39.74R.

Carrier Corporation: *See—*
Geary, Carl H.; and Taylor, Owen S., 3,921,986.
Murnane, Raymond J.; and Bolton, Theodore S., 3,921,416.

Carter, Christopher Robert: *See—*
Spicer, Lyndon R.; and Carter, Christopher Robert, 3,921,378.

Carter, Lewis D. Heavy duty trunnion mounting for an earth moving vehicle. 3,922,040, Cl. 308-72.000.

Casazza, Nello Louis. Fish holder. 3,921,327, Cl. 43-4.000.

Casey, Thomas P., to Caterpillar Tractor Co. Weldment for bulldozer blades. 3,921,728, Cl. 172-745.000.

Casselbrant, Sven Gustav, to Sven Casselbrant & Co. Apparatus for treatment of material in a channel. 3,921,794, Cl. 198-215.000.

Castagna, John Frank, to Optasound Corporation. Synchronizing system for recording visual images and sound. 3,922,075, Cl. 352-16.000.

Caterpillar Tractor Co.: *See—*
Bentz, Erwin J. H.; Getz, Marvin G.; and Stapf, Roger A., 3,921,603.
Casey, Thomas P., 3,921,728.
Cobb, Delwin Earl, 3,922,017.
Frantzreb, John G., Sr.; and Nieman, John R., 3,921,700.
Freese, Gary P., 3,921,314.
Grooss, Frank A., 3,921,833.
Julien, Fred E., Sr.; Raithel, Elmer A.; and Shafer, Carl W., 3,921,840.
Scoggin, Barry Alan; and Knell, Harvey Albert, 3,921,834.
Stedman, Robert N., 3,922,030.

Cavalier Products, Inc.: *See—*
Cavallaro, Angelo C.; and Crehore, Jon F., 3,922,082.

Cavallaro, Angelo C.; and Crehore, Jon F., to Cavalier Products, Inc. Bond paper photocopying machine. 3,922,082, Cl. 355-3.00R.

Cave, David L.; and Davis, Walter R., to Motorola, Inc. Current regulator. 3,922,596, Cl. 323-4.000.

Cementation Chemicals Limited: *See—*
Burns, Donald Anthony, 3,921,800.

Cenker, Moses: *See—*
Narayan, Thirumurti L.; and Cenker, Moses, 3,922,238.

Cepuritis, Talivaldis, to Johnson & Johnson. Disposable diaper having fastening tabs tucked in facing sheet thereof. 3,921,639, Cl. 128-287.000.

Cerberus AG: *See—*
Horvath, Zoltan; and Purt, Gustav, 3,922,656.

Cerny, Daryl D.; and Rodenberger, Phillip R., to Ball Corporation. Stranded torsion bar for maintaining a printing plate on a printing cylinder. 3,921,526, Cl. 101-415.100.

Ceskoslovenska akademie ved: *See—*
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Cetrulo, Frank A., Jr., to National Factors, Inc. Tomato harvesting header attachment for potato combine. 3,921,375, Cl. 56-327.00R.

Ceyzeriat, Louis; and Letoffe, Michel, to Rhone-Poulenc S.A. Organopolysiloxane compositions which cure at ambient temperature. 3,922,246, Cl. 260-37.0SB.

CF Industries, Inc.: *See—*
Van Moorsel, William H., 3,922,222.

Chair-E-Yacht, Inc.: *See—*
Forster, Larry G., 3,921,740.

Challenge-Cook Bros., Incorporated: *See—*
Freze, Benjamin H., 3,921,308.

Chamberlain, Bruce C., to Winn-Boughton Limited. Vehicle load securing device. 3,922,004, Cl. 280-179.00R.

Champion, Robert J.; Palm, Ronald K.; Harris, Jesse P. T., Jr.; and Kivett, William D., to Engineering Development Associates Incorporated. Count interval sampling mechanism. 3,921,821, Cl. 214-1.0BH.

Chapin, Jay C., to Ventron Corporation. Rendering a cellulose-polyester fabric flame retardant. 3,922,406, Cl. 427-402.000.

Chapman, Howard G.: *See—*
Wildhaber, Ernest; and Chapman, Howard G., 3,921,567.

Chappius, William George: *See—*
Warren, Loring Ferdinand; and Chappius, William George, 3,921,244.

Chapuis, Anne Marie; and DaJlevic, Danielle, to Commissariat a l'Energie Atomique. Portable instrument for selectively detecting alpha-particles derived from radon. 3,922,555, Cl. 250-472.000.

Chartrand, Guy; and Des Aulniers, Jacques. Remote controlled strong box assembly and latch therefor. 3,921,541, Cl. 109-59.000.

Chemische Werke Huels Aktiengesellschaft: *See—*
Berg, Gerhard; Nordsiek, Karl-Heinz; and Barnstedt, Egge, 3,922,240.

Chevron Research Company: *See—*
Silcox, William H., 3,921,500.

Chew, Thomas: *See—*
Nye, James Leroy; Barr, Samuel Rothrock; Chew, Thomas; and Steyer, William, 3,921,906.

Chiabrandy, Robert J., to Kayser-Roth Corporation. Apparatus for feeding and cutting a band of sheet material. 3,921,483, Cl. 83-277.000.

Chibata, Ichiro; Tosa, Tetsuya; Sato, Tadashi; and Yamamoto, Kozo, to Tanabe Seiyaku Co. Ltd. Process for preparing L-Malic acid. 3,922,195, Cl. 195-30.000.

Child, Edward T., to Texaco Development Corporation. Production of methane-rich gas. 3,922,148, Cl. 48-197.00R.

Choay S.A.: *See—*
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., 3,922,338.
Sach, Edgar; and Raby, Claude, 3,922,259.

Cholvin, Robert L.: *See—*
McInerney, Charles E.; Cholvin, Robert L.; and Egli, Hans, 3,921,403.

Christe, Karl O.; and Schack, Carl J., to United States of America, Navy. Iodine perchlorates. 3,922,336, Cl. 423-466.000.

Christensen, Borge. Apparatus for forming continuous lengths of construction elements. 3,922,125, Cl. 425-64.000.

Christianson, Robert W.; and Elsner, Else, to Whirlpool Corporation. Top lock and locator for appliance. 3,922,048, Cl. 312-284.000.

Christine, William C.; and Watt, William E. R. Applicator dispenser. 3,922,099, Cl. 401-134.000.

Christmann, Wolfgang; Klunsch, Maximilian; and Lingens, Paul, to Dynamit Nobel Aktiengesellschaft. Method of filling aquiferous boreholes with explosives. 3,921,497, Cl. 86-20.00C.

Christopher, Gary L.: *See—*
Bates, David A.; Christopher, Gary L.; and Hall, George R., II, 3,922,688.

Chromalloy American Corporation: *See—*
Speirs, Kenneth K.; Weinstein, Martin; and Dean, Michael F., 3,922,396.
Sweeney, Raymond G.; and Thyberg, Michael M., 3,921,586.

Chrysler Corporation: *See—*
Platzer, George E., Jr., 3,921,453.

Church, Allen R.; and Huppi, Gerhard A., to Upjohn Company, The. Organic compounds and process. 3,922,163, Cl. 71-95.000.

Ciba-Geigy AG: *See—*
Martin, Henry; Rufener, Jacques; and Pissiotas, Georg, 3,922,158.

Ciba-Geigy Corporation: *See—*
Riccio, Pasquale R., 3,921,857.

Cimino, Alfonse, to Butler Industries, Inc. Knockdown display rack. 3,921,813, Cl. 211-131.000.

Cities Service Oil Company: *See—*
Roth, Shirley H., 3,922,251.
Versnel, John; and Wolford, Lionel T., 3,922,316.

Clampitt, Richard L., to Phillips Petroleum Company. Method of drilling a borehole using gelled polymers. 3,921,733, Cl. 175-65.000.

Clarion Co., Ltd.: *See—*
Negishi, Tokuji; and Yoshida, Motomasa, 3,922,719.

Clark, Gaylord J. Window brush. 3,921,242, Cl. 15-21.00D.

Clark, Gaylord J. Cylindrical brush with stub shaft support. 3,921,245, Cl. 15-179.000.

Clark, Kenneth M.; and Malsby, Marc W., to Deutsch Company Electronic Components Division, The. Self-aligning optical waveguide connector. 3,922,064, Cl. 350-96.00C.

Clarke, Peter Alec: *See—*
Hinchcliffe, Dennis; and Clarke, Peter Alec, 3,921,790.

Clarke, Robert L.: *See—*
Shaw, Philip E.; Daum, Sol J.; and Clarke, Robert L., 3,922,312.

Clayton & Lambert Manufacturing Co.: *See—*
Lambert, Charles F., Jr., 3,921,829.

Cleary, James W., to Phillips Petroleum Company. Late addition of alkali metal sulfonate dye receptivity additive in polyesterification process. 3,922,250, Cl. 260-49.000.

Clemens, Richard W., Jr. Wrecking tool. 3,921,288, Cl. 30-299.000.

Clendinning, Robert A.; Potts, James E.; and Cornell, Stephen W., to Union Carbide Corporation. Transplanter containers made from biodegradable-environmentally degradable blends. 3,921,333, Cl. 47-37.000.

Clinch, Colin W. F.: *See—*
Fernberg, Paul C.; and Clinch, Colin W. F., 3,921,849.

Clinton, William P.: *See—*
Dietrich, Paul; Thomas, Alan F.; Clinton, William P.; and Parliment, Thomas H., 3,922,310.
Dietrich, Paul; Thomas, Alan F.; Clinton, William P.; and Parliment, Thomas H., 3,922,351.

Clippard Instrument Laboratory Inc.: *See—*
Clippard, William L., Jr.; and Kaera, Kaarel, 3,921,670.

Clippard, William L., Jr.; and Kaera, Kaarel, to Clippard Instrument Laboratory Inc. Magnetically operated valve with spider armature. 3,921,670, Cl. 137-625.650.

Clutter, Melvin E.; and West, Edward L., to A. B. Chance Company. Live line pole top cover. 3,922,476, Cl. 174-5.00R.

Coast Catamaran Corporation: *See—*
Arce, Henry L., 3,921,561.

Cobb, Delwin Earl, to Caterpillar Tractor Co. Impact material fracturing device for excavators and the like. 3,922,017, Cl. 299-70.000.

Cochran, Michael J., to Texas Instruments Incorporated. Driver means for lsi calculator to reduce power consumption. 3,922,526, Cl. 235-152.000.

Cochran, Michael J.; and Grant, Charles P., Jr., to Texas Instruments Incorporated. Calculator system featuring relative program memory. 3,922,538, Cl. 235-156.000.

Cocuzza, Gioacchino; Montoro, Italo; and Calcagno, Bendetto, to Societa' Italiana Resine S.I.R. S.p.A. Process for the preparation of ethylene glycol. 3,922,314, Cl. 260-635.00E.

Coe, Donald K., to Loc-Coe. Manhole cover lock. 3,921,494, Cl. 85-3.00R.

Coe, George Harold; and Bowden, Ronald Percy, to Metering Pumps Limited. Pump. 3,922,115, Cl. 417-374.000.

Cohen, Georges; Gracco, Francis; and Mikitenko, Paul, to Institut Francais du Petrole. Removal of polar compounds from hydrocarbon mixtures containing the same. 3,922,217, Cl. 208-299.000.

Cohly, Mauj A., to Tee-Pak, Inc. Sulfite catalyzed aluminum tannage of collagen casing. 3,922,356, Cl. 426-277.000.

Colding, Bertil; Novak, Arne; and Sandstrom, Unto, to Verkstadsteknik AB. Apparatus for measuring diameter, out-of-roundness and vibration of an object to be measured. 3,922,094, Cl. 356-167.000.

Coldren, Larry Allen: *See—*
Boyd, Gary Delane; and Coldren, Larry Allen, 3,922,622.

Cole, Edward Michael. Method and apparatus for ultrasonic detection of inclusions in a flowing fluid. 3,921,622, Cl. 128-2.00V.

Cole, James D. Automatic, temperature responsive damper assembly. 3,921,900, Cl. 236-93.000.

Colgate-Palmolive Company: *See—*
Schaar, Charles H., 3,921,638.

Colombani, Piero. Siphon for molten metals with suction actuator. 3,921,859, Cl. 222-204.000.

Columbia Ribbon and Carbon Manufacturing Co., Inc.: *See—*
Brown, Albert E.; Schlotzhauer, Allan T.; and Newman, Douglas A., 3,922,438.

Columbus McKinnon Corporation: *See—*
Smith, Burton H., 3,921,471.
Ulbing, Otmar M., 3,921,959.

Colvin, Gabriel M.; and Urick, Robert J., to United States of America, Navy. Method of locating and destroying water borne targets. 3,922,635, Cl. 340-6.00R.

Combustion Engineering, Inc.: *See—*
Makuch, John Andrew, 3,921,546.

Combustion Power Company, Inc.: *See—*
Reese, Richard G., 3,921,544.

Commissariat a l'Energie Atomique: *See—*
Chapuis, Anne Marie; and DaJlevic, Danielle, 3,922,555.
Tanguy, Jean-Claude, 3,922,542.

Commonwealth Scientific and Industrial Research Organization: *See—*
Reid, Allen Forrest; and Sinha, Hari Narayan, 3,922,164.

Communication Satellite Corporation: *See—*
Gruner, Robert Walter, 3,922,621.

Communications Patents Limited: *See—*
Gabriel, Ralph Parton; and Gargini, Eric John, 3,922,482.

Communications Satellite Corporation (COMSAT): *See—*
Hyde, Geoffrey, 3,922,682.

Compagnie Europeenne pour l'Equipement Menager, CEPEM: *See—*
Capy, Marcel, 3,921,913.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Delavie, Jean-Henri, 3,922,714.
Migeon, Rene, 3,922,559.
Van Cakenberghe, Jean L., 3,922,214.

Compere, Newton L. Rupturable blister pill package with safety backing. 3,921,805, Cl. 206-532.000.

Conant, Robert K.: *See—*
Barcomb, James G.; and Conant, Robert K., 3,921,517.

Concrete Pipe Machinery Company: *See—*
Crawford, Gerald R.; and Wenther, Joseph F., 3,922,133.

Condet, Claude; and Verdiere, Francois, to Automobiles Peugeot. Air distributing outlet structure in particular for automobile vehicles. 3,921,507, Cl. 98-2.000.

Connelly, Edward B.; and Weber, Reinhart. House construction and subassemblies thereof. 3,921,354, Cl. 52-237.000.

Connor, Donald E.; and Boetto, Charles, to International Harvester Company. Cultivator having plurality of laterally adjustable tool supporting beams. 3,921,726, Cl. 172-646.000.

Consolidation Coal Company: *See—*
Poundstone, William N., 3,922,015.

Continental Industries, Inc.: *See—*
Stiner, Roy E.; and Johnston, John David, 3,922,008.

Continental Oil Company: *See—*
Reynolds, Edward B.; Pert, Donald M.; and Zanier, Aldo M., 3,921,732.
Umphrey, Ronald W., 3,921,534.

Cook, Leslie George, to Straight Jane Mops Limited. Mop wringer attachment for a bucket. 3,921,247, Cl. 15-262.000.

Cook, Rufus L.; and Elkins, James H., to United States of America, Navy. Electroacoustical transducer. 3,922,572, Cl. 310-9.100.

Coon, James D., to Western Power Products, Inc. Pole top insulator mounting bracket. 3,921,949, Cl. 248-221.000.

Coop, Jack A. Method of making and applying a tear-off cap closure. 3,921,366, Cl. 53-15.000.

Cooper, Gordon Arthur; Goddard, Kenneth Douglas; and Lowe, Gordon Campbell, to British Minister of Defence. Data signal switching apparatus. 3,922,494, Cl. 179-15.0BV.

Copal Company Limited: *See—*
Matsumoto, Kunio, 3,922,691.

Cordone, Leonard G., to Ford Motor Company. Method for improving bond between transplanted coating and die-casting. 3,921,701, Cl. 164-98.000.

Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, to Ford Motor Company. Method of improving the surface finish of as-plated elnisil coatings. 3,922,208, Cl. 204-16.000.

Corey, Albert E.; and Donermeyer, Donald D., to Monsanto Company. Acid-modified poly(vinyl acetate-vinyl propionate) textile sizes. 3,922,461, Cl. 428-265.000.

Corliss, Robert F.; and Wilkinson, Frank, to Tyme Valve Corporation. Battery operated, fluid pressure responsive valve controller. 3,921,667, Cl. 137-624.150.

Cornelius, David L., Jr.: *See—*
Bell, Richard J.; Wynn, John D.; Denton, George T.; Sand, Ralph E.; and Cornelius, David L., Jr., 3,922,374.

Cornell, Stephen W.: *See—*
Clendinning, Robert A.; Potts, James E.; and Cornell, Stephen W., 3,921,333.

Corning Glass Works: *See—*
Forker, Ray B., Jr.; and Panzarino, Joseph N., 3,922,452.
Vogel, Herman J., Jr., 3,921,845.

Corrie, John Douglas: *See—*
Norton, David John; and Corrie, John Douglas, 3,921,946.

Corse, Louis. Device for regulating the tension in webs of material. 3,921,876, Cl. 226-39.000.

Corte, Francisco Barcelloni. Hand labelling device. 3,921,781, Cl. 197-6.700.

Costecalde, Andre Marcel: *See—*
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Cosyns, Jean: *See—*
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Ingram, Robert F., III, 3,921,224.

Cowan, Wavell Frederick, to Inotech Process Limited. Vacuum drainage device having a plurality of stepped blades. 3,922,190, Cl. 162-352.000.

Cox, Joe T.; and Prince, Thomas E., to United States of America, Navy. Temperature compensated measuring gauge. 3,921,300, Cl. 33-125.00T.

CPC International Inc.: *See—*
Hebeda, Ronald Emil; Holik, Dennis John; and Leach, Harry Woods, 3,922,199.
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Craig, John C., Jr.: *See—*
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Craven, Patrick: *See—*
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Crawford, Gerald R.; and Wenther, Joseph F., to Concrete Pipe Machinery Company. Pipe forming packerhead apparatus with spigot end pressing means. 3,922,133, Cl. 425-262.000.

CRC-Crose International, Inc.: *See—*
Nelson, Jerome W.; Nay, Earl B.; Wittman, Eric W.; and Pollock, Robert E., deceased, 3,922,517.

Crehore, Jon F.: *See—*
Cavallaro, Angelo C.; and Crehore, Jon F., 3,922,082.

Crinkelmeyer, Oliver W.; and Morris, Earl F., to Dow Chemical Company, The. High-alumina cement. 3,922,172, Cl. 106-104.000.

Crockett, Robert Raymond, to Alpha Machine & Tool Corporation. Picker. 3,921,820, Cl. 214-1.0BB.

Cronin, Leo J., to Spectra-Mat, Inc. Thermionic cathode comprising mixture of barium oxide, calcium oxide and samarium oxide. 3,922,428, Cl. 428-312.000.

Crookshanks, Rex John: *See—*
Shaw, Benjamin Chandler; and Crookshanks, Rex John, 3,922,670.

Crotti, Renato. Apparatus for producing a coiled thread package. 3,921,267, Cl. 28-21.000.

Crowder, Billy L.; and Tan, Swie-In, to International Business Machines Corporation. Method of producing high value ion implanted resistors. 3,922,708, Cl. 357-51.000.

Crowley, Arnold H.; Dunn, Allan G.; and Scharfenberger, Edward A., to Raytheon Company. Radiometric system. 3,922,550, Cl. 250-338.000.

CSELT Centro Studi e Laboratori Telecommunicazioni: *See—*
Artom, Auro; and DeMichelis, Carlo, 3,922,497.

Cunningham, James A.; Wakefield, Robert H., Jr.; and Guidry, Mark R., Jr., to Texas Instruments Incorporated. Insulated gate field effect transistor circuits and their method of fabrication. 3,921,282, Cl. 29-571.000.

Cuntze, Ulrich: *See—*
Raether, Wolfgang; Diery, Helmut; and Cuntze, Ulrich, 3,922,344.

Curran Oils Limited: *See—*
Lynch, Francis Bernard, 3,922,458.

Curry, Jimmy L.; and Moore, Curtis E. Chimney cover assembly. 3,921,509, Cl. 98-59.000.

Curry, Renwick E.; and Sheena, David, to Whittaker Corporation. Apparatus and method for maintaining operator alertness. 3,922,665, Cl. 340-279.000.

Cutler-Hammer, Inc.: *See—*
Denniston, William B.; and Hertz, Robert F., 3,922,617.

Cylpik, Incorporated: *See—*
Van Schoyck, Quentin H., 3,921,350.

Daab, Heinz; and Kling, Rudolf, to Quick-Rotan Becker & Notz KG. Arrangement for driving two output shafts. 3,921,770, Cl. 192-12.00D.

Daams, Jasper, to U.S. Philips Corporation. Method of improving the pickability and the ripening of fruit, and preparation for use in this method. 3,922,159, Cl. 71-90.000.

Dacons, Joseph C.: *See—*
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Dahlberg, John R.; and Grove, Robert H., to PPG Industries, Inc. Method for trimming glass. 3,921,873, Cl. 225-2.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Takehara, Kikuo; Okajima, Shigeaki; Komori, Saburo; and Agawa, Toshio, 3,922,303.

Dai Nippon Printing Company Limited: *See—*
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Dai Nippon Toryo Kabushiki Kaisha: *See—*
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Daido Seiko Kabushiki Kaisha: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
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Daiwa Boseki Kabushiki Kaisha: *See—*
Katayama, Shigeo; Sato, Katsunori; Miyagawa, Tomoyuki; Takahashi, Hisateru; Kato, Takashi; Yoshizawa, Toshio; and Yamada, Yasuo, 3,921,921.

DaJlevic, Danielle: *See—*
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Dalan, Ernesto; Groux, Michel John Arthur; and Hidalgo, Jaime, to Societe d'Assistance Technique pour Produits Nestle S.A. Preparation of a soluble whey protein fraction. 3,922,375, Cl. 426-583.000.

Dale Electronics, Inc.: *See—*
Klug, Robert F., 3,921,865.

Daley, Thomas G. Method for making a support for an object. 3,921,279, Cl. 29-458.000.

Daly, William T.: *See—*
Smeda, Ralph; Mindell, Marvin I.; and Daly, William T., 3,921,310.

Daman, Louis F.; and Ketterer, Stanley J., to Singer Company, The. Work feed mechanisms for sewing machines. 3,921,552, Cl. 112-215.000.

D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., to American Bank Note Company. Adjustable and retractable ink supply mechanism for printing press. 3,921,525, Cl. 101-365.000.

Dameron, Jennie Rose. Media holders for bookshelves. 3,921,811, Cl. 211-43.000.

Damico, Frank M., to Joerns Furniture Company. Hospital bed service unit. 3,921,345, Cl. 52-28.000.

Dandliker, Rene; and Mottier, Francois M., to BBC Brown, Boveri & Cie., AG. Device for measuring the roughness of a surface. 3,922,093, Cl. 356-120.000.

Daniele, Donald T.: *See—*
Witt, Edgar C.; and Daniele, Donald T., 3,922,191.

Danielsson, Nils Allan; and Lindblom, Karl-Peter Christian. Apparatus and method for the uniform separation of spectral orders. 3,922,089, Cl. 356-74.000.

Danjushevsky, Solomon Isaakovich; Liogonkaya, Rakhil Izrailevna; and Sudakas, Lev Girshovich. Method for cementing wells. 3,921,717, Cl. 166-292.000.

Darlington, William B.: *See—*
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Dassy, Raymond M.: *See—*
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Datta, Pabitra, to Addressorgrap Multigraph Corporation. Chemically treated carrier particles for use in electrophotographic process. 3,922,381, Cl. 427-21.000.

Dattilo, Donald J., to Motorola, Inc. Two piece sheet metal capstan housing assembly. 3,921,881, Cl. 226-194.000.

Dauernheim, Hans: *See—*
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Davis, Carl W., to Polaroid Corporation. Carrying strap attachment for a photographic camera. 3,922,694, Cl. 354-82.000.

Davis, Walter R.: *See—*
Cave, David L.; and Davis, Walter R., 3,922,596.

Dawes, Ernest Frederick. Syringes for making precision volume measurements. 3,921,864, Cl. 222-386.000.

Dawidowitsch, Peter: *See—*
Geyken, Erwin; Schwarzmaier, Gerhard; and Dawidowitsch, Peter, 3,922,701.

Day, Lawrence, to Spitfire Tool & Machine Co., Inc. Lap plate. 3,921,342, Cl. 51-209.0DL.

Dayco Corporation: *See—*
Logan, Arthur D.; and Rush, James B., 3,921,674.

Dean, Carl J.; and Cournoyer, Bernard T., to Barry Wright Corporation. Cartridge label holder. 3,921,798, Cl. 206-53.000.

Dean, Michael F.: *See—*
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DeAngelis, Gerald G.: *See—*
Lipinski, Christopher A.; Stam, John G.; DeAngelis, Gerald G.; and Hess, Hans-Jurgen E., 3,922,345.

Debs, Victor. Wand operated venetian blind. 3,921,695, Cl. 160-176.000.

Dechelette, Helen, to AMP Incorporated. Printed circuit electrical connector. 3,922,054, Cl. 339-75.0MP.

DeCuir, Talford S.: *See—*
Brown, Archer W., deceased; and DeCuir, Talford S., 3,921,815.

Deering Milliken, Inc.: *See—*
Priester, Amos U., Jr., 3,922,404.

Deering Milliken Research Corporation: *See—*
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DeJean, Jacques Henri, to International Standard Electric Corporation. Signalling system. 3,922,486, Cl. 178-68.000.

Delalande S.A.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,922,280.

Delavie, Jean-Henri, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for transmitting and reproducing color pictures. 3,922,714, Cl. 358-75.000.

Delorenzo, John D.: *See—*
Allen, William Reed; and Delorenzo, John D., 3,922,613.

DeLuca, John P.; Murrell, Lawrence L.; Rhodes, Richard P.; and Tauster, Samuel J., to Exxon Research & Engineering Co. Stabilized ruthenium catalysts for selective reduction of oxides of nitrogen. 3,922,235, Cl. 252-472.000.

Demac Engineering Ltd.: *See—*
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De Marinis, Robert M.; and Hoover, John R. E., to SmithKline Corporation. Substituted sulfonylacetamido cephalosporins. 3,922,267, Cl. 260-243.00C.

DeMichelis, Carlo: *See—*
Artom, Auro; and DeMichelis, Carlo, 3,922,497.

De Nardis, Floyd, to Uniroyal, Inc. Pneumatic tire shaping apparatus. 3,922,187, Cl. 156-415.000.

Dennis, Ronald E.; and Treece, William D., to General Electric Company. Air-cooled turbine blade and method of making same. 3,921,271, Cl. 29-156.80H.

Dennison Manufacturing Company: *See—*
Asnes, Benjamin, 3,922,435.

Denniston, William B.; and Hertz, Robert F., to Cutler-Hammer, Inc. Adaptive feed forward system. 3,922,617, Cl. 330-149.000.

Denny, Hugh W., to United States of America, Army. Electromagnetic interference locator. 3,922,608, Cl. 325-363.000.

Denton, George T.: *See—*
Bell, Richard J.; Wynn, John D.; Denton, George T.; Sand, Ralph E.; and Cornelius, David L., Jr., 3,922,374.

Derfer, John M.; and Bledsoe, James O., Jr., to SCM Corporation. Hydrolyzed diels-alder adducts of ocimenol. 3,922,308, Cl. 260-598.000.

Derse, Philip H.: *See—*
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Des Aulniers, Jacques: *See—*
Chartrand, Guy; and Des Aulniers, Jacques, 3,921,541.

De Shores, Robert E. Modular aquarium system. 3,921,583, Cl. 119-5.000.

Deters, Elmer M., to Weil-McLain Company, Inc. Control apparatus for a water supply system. 3,922,111, Cl. 417-26.000.

Deutsch Company Electronic Components Division, The: *See—*
Clark, Kenneth M.; and Malsby, Marc W., 3,922,064.

Deutsch, Daniel H. Cyclization of glyoxylic acid semicarbazone. 3,922,273, Cl. 260-248.0AS.

Deutsch, Josef, to Siemens Aktiengesellschaft. Circulator with connecting arms designed in accordance with the MIC technique. 3,922,620, Cl. 333-1.100.

Deutsche Bendix Ausrustungs GmbH: *See—*
Lauer, Josef; and Thomas, Alfred William, 3,921,502.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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Devellian, Richard D.: *See—*
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Dexter, Warren L., to Electra-Bond, Inc. Process of tire recapping and cushion therefor. 3,922,415, Cl. 428-133.000.

Diamond International Corporation: *See—*
Witt, Edgar C.; and Daniele, Donald T., 3,922,191.

Dick, Edgar: *See—*
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Dicom Systems Ltd.: *See—*
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Diener, Erhard Armin, to Industrial Development Bank. Combustible core with interior pipe holding means. 3,921,953, Cl. 249-62.000.

Diery, Helmut: *See—*
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Dietrich, Howard H. Clutch with slack take up and release motors. 3,921,773, Cl. 192-83.000.

Dietrich, Paul; Thomas, Alan F.; Clinton, William P.; and Parliment, Thomas H., to General Foods Corporation. Flavor compositions and processes. 3,922,310, Cl. 260-601.00R.

Dietrich, Paul; Thomas, Alan F.; Clinton, William P.; and Parliment, Thomas H., to General Foods Corporation. Enhancement of flavor with 2,5,5-trimethyl-hepta-2,6-dienal and lower alkyl acetals thereof. 3,922,351, Cl. 426-534.000.

Dighe, Kamalakar D., to Baxter Laboratories, Inc. Power line fault indicating system employing a neon lamp oscillator. 3,922,659, Cl. 340-253.00Q.

Di Giacomo, Sebastian F., to Gull Airborne Instruments, Inc. Apparatus for electrical inspection of inaccessible elements. 3,921,451, Cl. 73-304.00C.

Digital Communications Corporation: *See—*
Gabbard, Ova Gene; Husted, John M.; Kaul, Pradman P.; Werth, Andrew M.; and Walker, Andrew M., 3,922,496.

Dillow, Brian St. Pierre, to Misomex Aktiebolag. Multiple copying method and apparatus. 3,922,087, Cl. 355-87.000.

Director of National Food Research Inst.: *See—*
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Dischinger, Gebhard, to Babolat-Maillot-Witt. Intermediate members for the crossing points of tennis racket stringings. 3,921,979, Cl. 273-73.00R.

Dixon, Paul H., to Babette Dixon as Trustee of a trust identified as Paul H. Dixon Trust dated Jan. 28, 1975. Machine for picking up, transferring and placing parts. 3,921,822, Cl. 214-1.0BB.

Dmitriev, Valery Sergeevich: *See—*
Bely, Igor Vasilievich; Gorkin, Leonid Davidovich; Dmitriev, Valery Sergeevich; Khvorost, Vladimir Jurievich; Khimenko, Lev Timofeevich; and Mezhuev, Alexandr Tikhonovich, 3,921,426.

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Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Dockendorf, William G.; and Gross, Harold, to Standard Brands Incorporated. Process for preparing acidified bread dough. 3,922,350, Cl. 426-25.000.

Dr. Ing. Rudolf Hell, GmbH: *See—*
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Hickey, Richard C.; Bond, John H.; and Watson, Tandy P., 3,921,969.

Dodge, Paul A. Bow string release devices. 3,921,615, Cl. 124-35.00A.

Doig, Kingsley Ferguson: *See—*
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Dokunikhin, Nikolai Stepanovich; and Vorozhtsov, Georgy Nikolaevich. Method of printing textiles with derivatives of 1,1'-dinaphthyl-4,4',5,5',8,8'-hexacarboxylic acid. 3,922,142, Cl. 8-39.000.

Dolansky, Josef: *See—*
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Dolata, Hans; and Sauermilch, Rolf, to Andreas Stihl Maschinenfabrik. Saw chain for motor chain saws. 3,921,490, Cl. 83-833.000.

Dolveck, Gilbert, to Aluminium Suisse S.A. Aerosol dispensing and similar metal cans adapted to contain a pressurized fluid. 3,921,848, Cl. 220-67.000.

Donakowski, William A.: *See—*
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Donche-Gay, Pierre, to American Engineering Company, Limited. Barbed wire machine. 3,921,680, Cl. 140-58.000.

Donermeyer, Donald D.: *See—*
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Donnerstag, Leonard: *See—*
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Donohoe, Douglas Carroll, to Bell Telephone Laboratories, Incorporated. Digital signaling on a pulse code modulation transmission system. 3,922,495, Cl. 179-15.0BY.
Dorland, E. Everett; Miller, Stephen H.; and Tucker, Archie J., to Eastman Kodak Company. Film cartridge. 3,921,934, Cl. 242-194.000.
Douglas, Peter; Pedder, David John; Swallow, Peter John; and Davies, Terrence Ardern, to Square D Company. Electrical contact materials. 3,922,236, Cl. 252-514.000.
Douyette, Melvin J., Sr.: *See—*
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Pugh, Toby Sydney, 3,922,116.
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Ducellier & Cie.: *See—*
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Ducharme, Paul H., to Fabco Metal Products, Inc. Washing and degreasing machine. 3,921,653, Cl. 134-102.000.
Duevel, Paul R., to King-Seeley Thermos Company. Bottle holder for lunch kit. 3,921,807, Cl. 206-544.000.
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Dumas, David H.: *See—*
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Duncan, Robert Louis, Jr.; and Boswell, Robert Frederick, Jr., to A. H. Robins Company, Incorporated. 1-Substituted-4-benzylidenepiperidines. 3,922,276, Cl. 260-293.760.
Duncombe, Edward; and McGonigal, Gerald, to United Kingdom Atomic Energy Authority. Nuclear reactor instrumentation. 3,922,192, Cl. 176-19.00R.
Dungan, Kendrick W.: *See—*
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Dunham-Bush, Inc.: *See—*
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Dyck, Lloyd R.; and Openshaw, Alexander N., to Aljac Devices Limited. Ratchet action open-end wrenches. 3,921,474, Cl. 81-91.00B.
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Franz, Arnold; and Stein, Werner, 3,922,459.
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Dysart, Theodore Rivers, to Dresser Industries, Inc. Rotary rock bit with cone mouth air screen. 3,921,735, Cl. 175-337.000.
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E. J. Products Corporation: *See—*
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Eduard Kusters Maschinenfabrik: *See—*
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Edwards, Horace Gales; and Sealey, James William, to Fortune Development Corporation. Pneumatic alarm system. 3,921,563, Cl. 116-65.000.
Edwards, Reginald Harold, to Dunlop Limited. Pneumatic tires. 3,921,690, Cl. 152-354.000.
Effenberger, Rudolf; Muller, Stefan; and Reinhardt, Heinz, to SKF Kugellagerfabriken GmbH. Apparatus for removing excess lubricant from antifriction bearings. 3,921,248, Cl. 15-304.000.
Eggert, Walter S., to United States of America, Navy. Armored headrest. 3,922,034, Cl. 297-216.000.
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Eguchi, Iwao; Shimamura, Tadao; and Takimoto, Yukio, to Nippon Electric Company Limited. Driver circuit for modulating diode. 3,922,570, Cl. 307-270.000.
Eisele, Judith A.: *See—*
MacDonald, David J.; and Eisele, Judith A., 3,922,331.
Ekbladh, Fred Vage Gunnar. Bandage. 3,921,629, Cl. 128-156.000.
Ekwall, Carl Gosta Bernhard; and Johansson, Sven Ingemar, to Atlas Copco Aktiebolag. Hydraulic impact device. 3,921,731, Cl. 173-57.000.
El Paso Products Company: *See—*
McFearin, Thurman Chestler, Jr., 3,922,296.
Elastometal Limited: *See—*
Fyfe, Edward R., 3,921,240.
Elba Werk, Maschinen-Gesellschaft mbH & Co.: *See—*
Feger, Herbert; and Hanns, Paul, 3,921,962.
Electra-Bond, Inc.: *See—*
Dexter, Warren L., 3,922,415.
Electricity Council, The: *See—*
Robinson, Graham; and Jones, Ivor Wynn, 3,922,176.
Electrostatic Equipment Corporation: *See—*
English, William P., 3,921,574.
Electrovert Inc.: *See—*
Elliott, Donald Allan; and Palko, Zoltan, 3,921,888.
Elektro-Physik, Hans Nix & Dr. -Ing. E. Steingroever KG.: *See—*
Steingroever, Erich; and Nix, Hans F., 3,922,599.
Eli Lilly and Company: *See—*
Bach, Nicholas J.; and Kornfeld, Edmund C., 3,922,347.
Murphy, Charles F.; and Webber, J. Alan, 3,922,268.
Elkins, James H.: *See—*
Cook, Rufus L.; and Elkins, James H., 3,922,572.
Elliott, Donald Allan; and Palko, Zoltan, to Electrovert Inc. Wave soldering of printed circuits. 3,921,888, Cl. 228-180.000.
Elliott, Michael; Janes, Norman Frank; and Pulman, David Allen, to National Research Development Corporation. Oximes of 3-formylcyclopropane carboxylic acid esters. 3,922,269, Cl. 260-347.400.
Ellis, James L., to Owens-Illinois, Inc. Surface having sealing glass composition thereon. 3,922,471, Cl. 428-427.000.
Elsner, Else: *See—*
Christianson, Robert W.; and Elsner, Else, 3,922,048.
Eltra Corporation: *See—*
Quantz, Chester C., 3,922,592.
Elvegaard, Eilif. Fastening device for tubes and the like. 3,921,263, Cl. 24-263.000.
Emberson, John Ernest. Adjustable drain fitting. 3,921,661, Cl. 137-356.000.
Emerson Electric Co.: *See—*
Sauer, Francis J., 3,922,575.
Enabnit, Robert S.; and Spriggel, Kenneth A., to Goodyear Tire & Rubber Company, The. Conveyor belt protection control and indicating system. 3,922,661, Cl. 340-259.000.
Endo, Yasuo: *See—*
Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, 3,922,519.
Enei, Hitoshi; Matsui, Hiroshi; and Hirose, Yoshio, to Ajinomoto Co., Inc. Method of producing guanosine-5'-monophosphate. 3,922,193, Cl. 195-28.00N.
Energy Conversion Devices, Inc.: *See—*
Buckley, William D., 3,922,648.
Engalitcheff, John, Jr.; Bradley, Wilson E., Jr.; and Schinner, Edward N., to Baltimore Aircoil Company, Inc. Injector type liquid cooling apparatus. 3,922,153, Cl. 55-257.060.
Engelhardt, Edward L., to Merck & Co., Inc. Chemical compounds. 3,922,305, Cl. 260-570.8TC.

Engelhardt, Werner: *See—*
Rosenkranz, Dieter; Bous, Karl; Schmidt, Roland; Engelhardt, Werner; and Vermehren, Gunter, 3,921,419.

Engineering Development Associates Incorporated: *See—*
Champion, Robert J.; Palm, Ronald K.; Harris, Jesse P. T., Jr.; and Kivett, William D., 3,921,821.

English, William P., to Electrostatic Equipment Corporation. Coating method with cleaning and apparatus therefor. 3,921,574, Cl. 118-106.000.

Enke, Glenn G.: *See—*
Steuer, Robert R.; and Enke, Glenn G., 3,922,598.

Enterprise Products, Inc.: *See—*
Hamrock, Edward M.; and Pressler, Earl David, 3,921,812.

Entwisle, John Hubert, to Imperial Chemical Industries Limited. Anodes for mercury-cathode electrolytic cells. 3,922,226, Cl. 204-290.00F.

Environmental Measurements, Inc.: *See—*
Newcomb, Gilbert S., Jr.; and Langan, Leon V., Jr., 3,921,456.

Erickson, Reinhold Barry; and Lipe, Bruce R., to Allis-Chalmers Corporation. Collapsible cooling tower. 3,921,902, Cl. 239-17.000.

Ernst Leitz G.m.b.H.: *See—*
Broemer, Heinz; Kaes, Hans-Herbert; and Pfeil, Emanuel, 3,922,155.

Esashi, Hanjiro; Urayama, Kiyosi; Kawamata, Katsuyoshi; Sugawara, Kokichi; and Tobe, Junichiro, to Sony Corporation. Tape reel. 3,921,927, Cl. 242-74.000.

Eschenbach, Paul W., to Deering Milliken Research Corporation. Method and apparatus to produce non-woven fabric. 3,921,265, Cl. 28-1.0CL.

Escher Wyss Limited: *See—*
Biondetti, Mario, 3,921,514.

Eska Company: *See—*
Tome, Floyd, 3,921,315.

Estes, John H.: *See—*
Wilson, Raymond F.; Estes, John H.; and Kravitz, Stanley, 3,922,216.

Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., to Choay S.A. Tablets containing in their mass controlled-release micro-capsules and process for manufacture of said tablets. 3,922,338, Cl. 424-21.000.

Etablissement Wanderfield & Co.: *See—*
Filter, Walther; and Filter, Claus, 3,921,675.
Filter, Walther, 3,921,677.

Etudes et Procedes d'Assainissement Purator EPAP, Societe Anonyme: *See—*
Lewandowski, Raymond, 3,922,224.

Etwell, Cecil C., to Massey-Ferguson Services N.V. Dispensing rod like articles. 3,921,547, Cl. 111-1.000.

Evans, Bruce Ronald: *See—*
Marek, Jiri Frantisek; Evans, Bruce Ronald; and Callcott, Thomas George, 3,921,307.

Evans, James P. Combination torqueing and ratcheting wrench for square members. 3,921,475, Cl. 81-119.000.

Evans, James P. Combination torqueing and ratcheting wrench for irregular hexagonal members. 3,921,476, Cl. 81-119.000.

Evers, William J.; Heinsohn, Howard R., Jr.; and Mayers, Bernard J., to International Flavors & Fragrances Inc. Processes for producing 3-thia furans and 3-furan thiols. 3,922,288, Cl. 260-347.200.

Every, Peter, to Kelsey-Hayes Company. Hydraulic skid control system embodying regulator. 3,922,021, Cl. 303-21.00F.

Exaprecis S.A.: *See—*
Lesur, Ernest Jacques Andre, 3,922,603.

Exxon Production Research Company: *See—*
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Exxon Research & Engineering Co.: *See—*
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Fabco Metal Products, Inc.: *See—*
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Fabricacion de Maquinas, S.A.: *See—*
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Wyslouch, Zenon; and Brachmanski, Eugeniusz, 3,921,836.

Fain, David L., to Teknekron, Inc. Method and apparatus for authenticating documents. 3,922,090, Cl. 356-71.000.

Fallows, John: *See—*
Tompkins, Lawrence K.; and Fallows, John, 3,922,043.

Farhadieh, Bahram, to Abbott Laboratories. Microencapsulation process. 3,922,379, Cl. 427-3.000.

Farmer Foundation Company: *See—*
Rich, Robert N.; and Owens, J. C., 3,921,739.

Farnbach, Frederick A. Pack frame strap connection means. 3,921,867, Cl. 224-25.00A.

Farre, Jean G.; and Dassy, Raymond M., to Societe Anonyme: Poclain. Earth working and work support machine. 3,921,730, Cl. 173-46.000.

Fattaleh, John B. Dental and surgical appliance. 3,921,298, Cl. 32-59.000.

Faulstich, Albert J., Jr.; and Hargett, Richard L., to United States of America, Navy. Land mine expulsion system. 3,921,528, Cl. 102-8.000.

Fauran, Claude P.; Eberle, Jeannine A.; Raynaud, Guy M.; and Pourrias, Bernard M., to Delalande S.A. Pharmacologically active 4,8-dimethoxy-furo (3',2'-F)benzoxazol-2-yl acethydroxamic acid. 3,922,280, Cl. 260-307.00D.

Fayolle, Michel: *See—*
Pruvot, Francois C.; and Fayolle, Michel, 3,922,000.

Feather, Jack V. Vibratory massager. 3,921,625, Cl. 128-63.000.

Feather Kogyo K.K.: *See—*
Hasegawa, Shigeki, 3,921,289.

Feger, Herbert; and Hanns, Paul, to Elba Werk, Maschinen-Gesellschaft mbH & Co. Shaft mounting for cement mixer or the like. 3,921,962, Cl. 259-178.00R.

Fehr, Jakob: *See—*
Neff, Engelbert; and Fehr, Jakob, 3,921,963.

Fehrer, Ernst. Needling machine. 3,921,266, Cl. 28-4.00R.

Feldkirchner, Harlan L.: *See—*
Linden, Henry R.; Tarman, Paul B.; and Feldkirchner, Harlan L., 3,922,215.

Feldman, Marshall H. Board game apparatus. 3,921,982, Cl. 273-135.0AC.

Feldstein, Nathan: *See—*
Schnable, George Luther; and Feldstein, Nathan, 3,922,420.

Feltzin, Joseph, to ICI America Inc. Method of making filament wound article. 3,922,426, Cl. 428-295.000.

Fennemann, Wolfgang: *See—*
Menigat, Richard; and Fennemann, Wolfgang, 3,921,543.

Feres, Vaclav, to Liquid Processing AB. Apparatus for indirect heat treatment of liquids. 3,921,709, Cl. 165-88.000.

Fernberg, Paul C.; and Clinch, Colin W. F., to ITW Limited. Sealing caps. 3,921,849, Cl. 220-295.000.

Ferno-Washington, Inc.: *See—*
Bourgraf, Elroy E.; Self, Kenneth R.; and Dunn, Robert E., 3,921,231.

Ferreri, John G.: *See—*
Wilson, Gerald M.; and Ferreri, John G., 3,921,627.

Fibinger, Vratislav: *See—*
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Filter, Claus: *See—*
Filter, Walther; and Filter, Claus, 3,921,675.

Filter, Walther; and Filter, Claus, to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft; and Etablissement Wanderfield & Co. Flat weaving machine. 3,921,675, Cl. 139-1.00C.

Filter, Walther, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft; and Etablissement Wanderfield & Co. Flat weaving machine. 3,921,677, Cl. 139-122.00H.

Filterwerk Mann & Hummel GmbH: *See—*
Alf, Herbert; and Behrendt, Bernhard, 3,922,010.

Fimml, Hans. Contactless flow-guidance system. 3,921,985, Cl. 277-22.000.

Finegold, Hyman B.: *See—*
Bucholtz, Glen E.; and Finegold, Hyman B., 3,921,284.

Finkel, Kenneth. Centrifuge. 3,921,898, Cl. 233-23.00A.

Firestone Tire & Rubber Company, The: *See—*
Spragg, Charles D.; and Tomaszewski, Walter, 3,922,123.

Firm of Georg Merkel, successor to Johann Hawner, KG, The: *See—*
Weisskopf, Ernst, 3,921,321.

Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,922,366.

Fish, William Joseph. Self-adhering medication time reminder. 3,921,568, Cl. 116-121.000.

Fishaber, Marvin H.; and White, Philip C., to Dow Chemical Company, The. Powderless etching bath for magnesium printing plates. 3,922,229, Cl. 252-79.400.

Fisher, Julian Vernon, to Illinois Tool Works Inc. Fastener. 3,921,261, Cl. 24-221.00R.

Fisher, Karol C. Apparatus for isolating and treating selected hair strands. 3,921,647, Cl. 132-9.000.

Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,922,366.

Flannery, Joe W., to Raymond Lee Organization, Inc., The, a part interest. Illuminated license plate. 3,921,324, Cl. 40-204.000.

Fleshman, James W.; Josephson, Edgar F.; and Stoller, David A., to ACF Industries, Incorporated. Structural hopper car. 3,921,537, Cl. 105-248.000.

Flo-Pac Corporation: *See—*
Pichelman, Franklin D., 3,921,246.

Flo-Tron, Inc.: *See—*
Masnik, Walter; and Bloom, Gerald, 3,921,448.

Florentine, Frank P.: *See—*
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Flymo Societe Anonyme: *See—*
Arnblock, Lennart Oswald, 3,921,372.

FMC Corporation: *See—*
Petrik, George L.; and Dvorsky, James R., 3,921,817.

Fogelgren, John E., to Haybro Co. Compressed gas operated gun having variable upper and lower pressure limits of operation. 3,921,614, Cl. 124-30.00R.

Fohl, Artur. Winding-up device with automatic lock initiated by friction for a safety belt. 3,921,930, Cl. 242-107.400.

Foley, Kevin M.; and McCombs, Frank P., to Owens-Corning Fiberglas Corporation. Glass fiber reinforced elastomers. 3,922,472, Cl. 428-429.000.

Foley, Kevin M.: *See—*
Bell, Reuben H.; and Foley, Kevin M., 3,922,436.
Bell, Reuben H.; and Foley, Kevin M., 3,922,466.

Follett, Michael John, to J. Sainsbury Limited. Treatment of raw meat. 3,922,358, Cl. 426-316.000.

Foote, Chauncey P., Jr.: *See—*
D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., 3,921,525.

Ford, James A.; and Butt, Sheldon H., to Olin Corporation. Method for producing a catalyst. 3,921,886, Cl. 228-117.000.

Ford Motor Company: *See—*
Cordone, Leonard G., 3,921,701.
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,922,208.

Forker, Ray B., Jr.; and Panzarino, Joseph N., to Corning Glass Works. Microwave browning vessel. 3,922,452, Cl. 428-35.000.

Formica, Thomas D.; Greenwood, Robert C.; and Jones, Thomas E., to Pan-Nova, Inc. Remote control console for a plurality of automatic gasoline dispensers. 3,921,854, Cl. 222-16.000.

Forster, Larry G., to Chair-E-Yacht, Inc. Self-propelled vehicle. 3,921,740, Cl. 180-26.00R.

Fortune Development Corporation: *See—*
Edwards, Horace Gales; and Sealey, James William, 3,921,563.

Fortune, William S. Miniature vacuum stroke cleaning implement. 3,921,249, Cl. 15-341.000.

Foster Electric Co., Ltd.: *See—*
Kishikawa, Kenichiro; and Honda, Yougi, 3,922,504.
Tabuchi, Shunichi, 3,922,502.
Tabuchi, Shunichi, 3,922,503.

Foster, James H.: *See—*
Borbas, Robert A.; Dufton, John P.; and Foster, James H., 3,922,644.

Foster, James R., Jr.; and Gakhar, Ved P., to General Electric Company. Hinge structure. 3,921,254, Cl. 16-176.000.

Foster, William R., to Mobil Oil Corporation. Waterflooding employing surfactants produced in situ. 3,921,714, Cl. 166-270.000.

Foucher, Walter D., Jr.: *See—*
Hellmuth, Walter W.; Foucher, Walter D., Jr.; and Siegart, William R., 3,922,227.

Fountain Industries, Inc.: *See—*
Syverson, Martelle J., 3,921,855.

Fowler, Dwight W. Sewer tapping method and apparatus. 3,922,107, Cl. 408-67.000.

Fox, Eugene R.: *See—*
O'Berry, William A.; Fox, Eugene R.; and Plante, Kenneth L., 3,922,676.

Foxboro Company, The: *See—*
Olsen, Everett O., 3,922,591.

France, Larry R.; and Sherman, John G., to Kent Cambridge Instrument Co. Electrocardiographic recording apparatus. 3,922,686, Cl. 346-33.0ME.

Franco, Salvatore M. Rotary internal combustion engine. 3,921,597, Cl. 123-8.310.

Frank, Harold G., to Dow Chemical Company, The. Blends of acid-containing copolymers and copolymers of acrylonitrile and a conjugated diolefin. 3,922,421, Cl. 428-214.000.

Frantzreb, John G., Sr.; and Nieman, John R., to Caterpillar Tractor Co. Composite metal article containing additive agents and method of adding same to molten metal. 3,921,700, Cl. 164-57.000.

Franz, Arnold; and Stein, Werner, to Dynamit Nobel Aktiengesellschaft. Process for the manufacture of flame-resistant laminates. 3,922,459, Cl. 428-297.000.

Fraser, Roger Alan: *See—*
Aul, Guy Darrell; Ballard, James Russell; and Fraser, Roger Alan, 3,922,498.

Freeborn, John O., to International Paper Company. Disposable surgical instruments. 3,921,640, Cl. 128-318.000.

Freed, Larry E.; Nestork, William J.; and Tuman, Daniel, to International Business Machines Corporation. DC testing of integrated circuits and a novel integrated circuit structure to facilitate such testing. 3,922,707, Cl. 357-48.000.

Freeman, Alfred B. Bass system for automatic root fifth and pedal sustain. 3,921,491, Cl. 84-1.010.

Freeman, John W., to ACF Industries, Incorporated. Means to minimize binding of slab gate valve. 3,921,957, Cl. 251-327.000.

Freeman, Lawrence M.; and Arnold, Francis T. Electrostatic copying device with paper cutter mechanism. 3,922,083, Cl. 355-13.000.

Freericks, Alfred H., to Addressograph Multigraph Corporation. Method of providing photocomposition indicia. 3,922,086, Cl. 355-76.000.

Freese, Gary P., to Caterpillar Tractor Co. Resilient link means for the apron of a self-loading scraper. 3,921,314, Cl. 37-8.000.

Frenkel, Marvin A. Police alarm system. 3,922,678, Cl. 343-112.00R.

Freres, Donald E., to Sterling Tool Company. Web processing apparatus and electric control therefor. 3,921,428, Cl. 72-185.000.

Freytag, Wolfram Gustav: *See—*
Ney, Karl Heinz; Wirotana, I. Poetoe Gde; and Freytag, Wolfram Gustav, 3,922,365.

Freze, Benjamin H., to Challenge-Cook Bros., Incorporated. Methods for treating yarn bundles. 3,921,308, Cl. 34-13.000.

Fried, John H.: *See—*
Patterson, John W.; and Fried, John H., 3,922,289.

Friedebach, Adolph Hans, to Keegan Steel Fabricating Co., Inc. Laterally shiftable hitch with optional free moving coupler. 3,922,007, Cl. 280-456.00R.

Friedrich Uhde GmbH: *See—*
Isfort, Heinz; and Ilgner, Hans-Peter, 3,922,210.

Frischman, Harald: *See—*
Hartmann, Hans-Joerg; Hartmann, Job-Werner; Frischman, Harald; and Vaeth, Guenter, 3,922,439.

Frohlich, Alfons, to Opti-Holding AG. Coupling element for slide fastener. 3,921,260, Cl. 24-205.13D.

Froman, Richard M.: *See—*
Toft, Roger D.; and Froman, Richard M., 3,921,516.

Froumajou, Armand, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Rotary cylinder internal combustion engine. 3,921,602, Cl. 123-44.00D.

Frye, George Joseph. Acoustical testing system. 3,922,506, Cl. 179-175.10A.

Fuchs, Edward Oscar; and Swisher, James Howe, to Bell Telephone Laboratories, Incorporated. Method for oxidation-hardening metal alloy compositions, and compositions and structures therefrom. 3,922,180, Cl. 148-11.50R.

Fuhrmann, Robert; Tunick, Allen A.; and Sifniades, Stylianos, to Allied Chemical Corporation. Rearrangement of aminocycloalkanone oximes to the corresponding lactams. 3,922,265, Cl. 260-239.30R.

Fuji Photo Film Co., Ltd.: *See—*
Asano, Yoshio; Kato, Kazunobu; Ito, Yasumichi; and Yoshida, Kazutaka, 3,922,700.
Ikegami, Yoshizo; and Miyauchi, Akio, 3,922,074.
Noguchi, Masaru, 3,922,059.
Oosaka, Shigenori; Noguchi, Masaru; and Takahashi, Tsunehiko, 3,922,060.
Shiba, Keisuke; and Sato, Akira, 3,922,170.

Fuji Photo Optical Co., Ltd.: *See—*
Kishikawa, Toshiro; Yoshikawa, Kazuo; Yamauchi, Toshiro; and Higuchi, Takeshi, 3,922,069.

Fuji Xerox Co., Ltd.: *See—*
Hiratsuka, Toshio, 3,922,662.

Fujiki, Tokio: *See—*
Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; and Saito, Mitsutaka, 3,922,473.

Fujio, Bunzo; Sasaki, Yasushi; Takata, Hiromi; and Yanagida, Syoji, to Yamura Kabushikikaisha Shinko Seisakusho. High Speed type positioning mechanism. 3,921,787, Cl. 197-53.000.

Fujita, Hirozo: *See—*
Shimamura, Hidehiko; and Fujita, Hirozo, 3,922,402.

Fujita, Saburo: *See—*
Hayashi, Masaharu; and Fujita, Saburo, 3,921,772.

Fukada, Tadayuki: *See—*
Toyoda, Takashi; Fukada, Tadayuki; Inoue, Masayuki; Takayama, Shigeru; Yui, Hiroshi; and Inoue, Takayuki, 3,922,427.

Fukuda Denshi Co., Ltd.: *See—*
Okada, Hiroshi; Horibe, Hiroshi; Mizuno, Yasushi; Yasui, Shoji; Ikegaya, Kazuo; and Suzumura, Nobuo, 3,921,623.

Fukunaga, Tatsumi: *See—*
Kitta, Toshiyuki; Miyata, Shohiko; Fukunaga, Tatsumi; and Kasahara, Mataichi, 3,922,437.

Fuller, Craig. Educational construction. 3,921,312, Cl. 35-27.000.

Furukawa, Yosio: *See—*
Sato, Hiroshi; Furukawa, Yosio; and Ozawa, Koji, 3,922,042.

Furuse, Takashi; and Kamata, Sachio, to Dowa Mining Co., Ltd., The. Automated device for taking out slabs from a continuous casting apparatus, bringing them into alignment and stacking them together. 3,921,705, Cl. 164-269.000.

Fusselman, David Francis: *See—*
Lemke, Timothy Allen; and Fusselman, David Francis, 3,922,057.

Futurumverken AB: *See—*
Bergmark, Nils Randolf; and Johansson, Karl-Gunnar Torbjorn, 3,921,657.

Fyfe, Edward R., to Elastometal Limited. Structural bearings. 3,921,240, Cl. 14-16.000.

Gabbard, Ova Gene; Husted, John M.; Kaul, Pradman P.; Werth, Andrew M.; and Walker, Andrew M., to Digital Communications Corporation. TDMA satellite communications system with guard band obviating ongoing propagation delay calculation. 3,922,496, Cl. 179-15.0BS.

Gabbert, James D.: *See—*
Hedrick, Ross Melvin; and Gabbert, James D., 3,922,254.

Gabr, Saad Zaghloul Mohamed, to A.R.D. Anstalt. Feedback-cancelling electro-acoustic transducer apparatus. 3,922,488, Cl. 179-1.0HF.

Gabriel, Ralph Parton; and Gargini, Eric John, to Communications Patents Limited. Wired broadcasting systems. 3,922,482, Cl. 178-5.100.

GAF Corporation: *See—*
Bettoli, Phillip S., 3,921,358.

Gakhar, Ved P.: *See—*
Foster, James R., Jr.; and Gakhar, Ved P., 3,921,254.

Galex, Gerald. Vertical venetian blinds. 3,921,694, Cl. 160-166.00A.

Gall, Charles Henri. Horizontal press. 3,921,511, Cl. 100-107.000.

Galluzzi, John F.; Saldarini, Albert V.; and Murray, Thomas E., to Norda Incorporated. Production of artificial spice particles. 3,922,354, Cl. 426-96.000.

Galvin, Aaron A., to American District Telegraph Company. Volumetric intrusion alarm using both Doppler and net-change signal processing. 3,922,660, Cl. 340-258.00A.

Ganslaw, Stuart H.: *See—*
Katz, Howard; and Ganslaw, Stuart H., 3,922,462.

Gansser, Robert E.: *See—*
Otrhalek, Joseph V.; and Gansser, Robert E., 3,922,390.

Garden, William David: *See—*
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Gardisette Holding AG: *See—*
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Garfinkle, Irwin P.; and McNair, Robert J., to Avco Corporation. Bicycle with electric motor assist. 3,921,741, Cl. 180-34.000.
Garfinkle, Marvin, to Helicorporation. Directional control system for helicopters. 3,921,939, Cl. 244-17.250.
Garfinkle, Marvin. Rotary combustion engine. 3,922,121, Cl. 418-61.00A.
Gargini, Eric John: *See—*
Gabriel, Ralph Parton; and Gargini, Eric John, 3,922,482.
Garrett Corporation, The: *See—*
McInerney, Charles E.; Cholvin, Robert L.; and Egli, Hans, 3,921,403.
Ruder, Joseph M.; and Iles, Thomas L., 3,922,149.
Gaskell, Alfred J., to Pako Corporation. Liquid circulating system for photographic film processing tanks. 3,922,702, Cl. 354-321.000.
Gaston County Dyeing Machine Company: *See—*
Aurich, Christoph W.; and Turner, James Keith, 3,921,420.
Gates, William A., Jr. Automatic video and audio source selector for entertainment center. 3,922,641, Cl. 340-147.0LP.
Gauthier, William Kohlmann. Shower head and douche. 3,921,635, Cl. 128-229.000.
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Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,922,366.
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Gebrueder Schmidt, Firma: *See—*
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Genbauffe, Francis S., to Robertshaw Controls Company. Plural range pressure regulator construction or the like and the method of making the same or the like. 3,921,966, Cl. 267-166.000.
General Dynamics Corporation: *See—*
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General Electric Company: *See—*
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General Motors Corporation: *See—*
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Konantz, Mark L.; and Leisure, Ronald K., 3,922,385.
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Stryker, Harry L., 3,922,712.
Woofter, Robert C.; and Pearce, Warren, Jr., 3,922,480.
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Gentzlinger, Richard V.; and Mailer, Werner H., to General Electric Company. Assembly for mounting a print head. 3,921,780, Cl. 197-1.00R.
George, Albert J. Plastic horse shoe and method of attachment. 3,921,721, Cl. 168-4.000.
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Johnston, David Ernest; and Russell, Peter John, 3,921,987.
Johnston, David Ernest; and Russell, Peter John, 3,921,990.
Gerstenmeier, Jurgen; and Korasiak, Wolfgang, to Teldix GmbH. Method and arrangement for measuring the pulse sequence frequency of a pulse sequence. 3,922,534, Cl. 235-151.320.
Gertz, Robert L.: *See—*
Rotter, Gerhard; Bleininger, Leonard S.; and Gertz, Robert L., 3,921,933.
Gesellschaft fur Strahlen-und Umweltforschung mbH, Munich: *See—*
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Geyken, Erwin; Schwarzmaier, Gerhard; and Dawidowitsch, Peter, to Agfa-Gevaert Aktiengesellschaft. Apparatus for processing photographic films. 3,922,701, Cl. 354-299.000.
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Gibbons, Delamar J. Disposable cup with integral seam straw. 3,921,889, Cl. 229-7.00S.
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Giebler, Fritz, to Siemens Aktiengesellschaft. Circuit arrangement for adjusting the line current in telegraphy subscriber connection circuits of an exchange installation. 3,922,487, Cl. 178-69.00R.
Gierek, Adam; Binczyk, Franciszek; and Kowalski, Andrzej, to Politechnika Slaska im. Wincentego Pstrowskiego. Method for improving abrasion resistance and for reducing friction of surfaces rubbing one against another in machinery. 3,922,211, Cl. 204-140.000.
Gilchrist, Allan E., to SCM Corporation. Cathodic electrodeposition of surface coatings and compositions therefor. 3,922,212, Cl. 204-181.000.
Gingras, Gerard J., Jr.; and Hanson, James T., to Raytheon Company. Transponder for use in a radio frequency communication system. 3,922,674, Cl. 343-6.80R.
Ginsky, Willard R., to United States of America, Air Force. Ammunition cook-off sensing and prevention system. 3,921,499, Cl. 89-12.000.
Girling Limited: *See—*
Harries, David Anthony, 3,922,023.
Gith, Walter, to W. Schlafhorst & Co. Electronic thread monitor for textile machines. 3,921,877, Cl. 226-43.000.
Glass, Alastair Malcolm; and von der Linde, Dietrich, to Bell Telephone Laboratories, Incorporated. Optical storage apparatus and process. 3,922,061, Cl. 350-3.500.
Glass, Marvin I., deceased: *See—*
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Glasson, Jean Emile, to Botalam. Apparatus for compacting and tying coils. 3,921,510, Cl. 100-7.000.
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Gleich, Walter A., to Shell Oil Company. C_5splitter operation with side draw removal of water to prevent hydrate formation. 3,921,411, Cl. 62-18.000.
Glenn, Lewis A.; Lemcke, Bo; and Ryhming, Inge, to Institut Cerac SA. Nozzle means producing a high-speed liquid jet. 3,921,915, Cl. 239-589.000.
Glicksman, Martin; and Wankier, Bartley N., to General Foods Corporation. Low calorie sweetening composition and method for making same. 3,922,369, Cl. 426-548.000.
Glindmeyer, Friedrich; Hennenberg, Wilhelm Friedrich; and Limpens, Karl, to William Pyrm-Werke KG. Woven zipper. 3,921,679, Cl. 139-384.000.
Globe Tool and Engineering Company, The: *See—*
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Goddard, Kenneth Douglas: *See—*
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Goff, Raymon L., to TRW Inc. Integral power steering gear and sintered metal valve sleeve therefor. 3,921,669, Cl. 137-625.240.
Goldinger, John A.; and Peterson, Dwight R., to PPG Industries, Inc. Method and apparatus for transferring articles from a conveyor. 3,921,789, Cl. 198-31.0AB.
Goldman, Irving M.: *See—*
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Gomez, Gerardo. Fruit peeler. 3,921,287, Cl. 30-280.000.
Goodfellow, Robert D., to Kennametal Inc. Raise boring head and rolling cutter arrangement therefor. 3,921,734, Cl. 175-364.000.
Goodman, David M. Detectors including scintillating means for beam index cathode ray tubes. 3,922,581, Cl. 313-471.000.
Goodman, Elliot L.: *See—*
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Goodman, Sigmund: *See—*
Hutchinson, Richard H., deceased; and Hutchinson, Claire T., executrix, 3,921,793.

Goodson, Sam M. Material handling device for feeding labels to a sewing machine. 3,921,549, Cl. 112-104.000.

Goodwin, Bertram R., to American Optical Corporation. Lens surfacing pads and method of making the same. 3,921,344, Cl. 51-395.000.

Goodyear Aerospace Corporation: *See—*
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Gordon, Robert T.: *See—*
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Gorkin, Leonid Davidovich: *See—*
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Gorky, Samson, to Airway Industries Inc. Luggage case. 3,921,768, Cl. 190-26.000.

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Goto, Naohiro; Izozaki, Yukinao; Shidara, Keiichi; Maruyama, Eiichi; Hirai, Tadaaki; Inao, Kiyohisa; and Mori, Ikue, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Photoconductive target. 3,922,579, Cl. 313-366.000.

Goto, Totaro: *See—*
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Grammatica, Steven James: *See—*
Bergfjord, John Alf; Grammatica, Steven James; and Radler, Richard William, 3,922,169.

Granqvist, Carl-Erik, to Aktiebolaget Tudor. Plural cell battery. 3,922,175, Cl. 136-6.00A.

Granstrom, Staffan; and Goransson, Ingemar, to Allmanna Svenska Elektriska Aktiebolaget. Electromagnetic valve for molten metal. 3,921,671, Cl. 137-807.000.

Grant, Charles P., Jr.: *See—*
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Gray Manufacturing Company: *See—*
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Green, Willard B., Jr.: *See—*
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Greenhut, Joseph. Stationary starting winding switch for electrical motors. 3,922,514, Cl. 200-246.000.

Greenlee Bros. & Co.: *See—*
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Greenwood, Robert C.: *See—*
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Gregg, Dwain G. Multi cushion flexible support bag with surface pressure valving for air cushion vehicle application. 3,921,752, Cl. 180-125.000.

Grein, Wilhelm: *See—*
Kiss, Ferenc; Grein, Wilhelm; and Zellmann, Karl, 3,922,151.

Greseth, Theodore S. Handlebar driven bicycle. 3,921,464, Cl. 74-37.000.

Gretz, Heinz: *See—*
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Grier, John D.: *See—*
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Griffin, James L.: *See—*
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Griffiths, Frederick J.: *See—*
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Grimes, Stephen L.; and Rainey, jerry M., to White-Westinghouse Corporation. Water cooler bubbler assembly. 3,921,903, Cl. 239-24.000.

Grof, Helmut Theodor; Sonntag, Heinrich Fritz; Scheidig, Helmut; and Wamser, Anton, to Leybold-Heraeus-Verwaltung G.m.b.H. Method for the production of metallic ingots. 3,921,698, Cl. 164-52.000.

Grohmann, Lothar, to International Standard Electric Corporation. Digital automatic frequency control loop for a local oscillator. 3,922,609, Cl. 325-423.000.

Groll, Robert M.: *See—*
Hengstler, Heinz; and Groll, Robert M., 3,921,875.

Grooss, Frank A., to Caterpillar Tractor Co. Material lifting and transporting vehicle. 3,921,833, Cl. 214-130.00C.

Groppel, Dieter; and Kuhl, Dieter, to Siemens Aktiengesellschaft. Method for controlling the water budget of rechargeable metal-air cells and metal-air batteries. 3,922,177, Cl. 136-86.000.

Gross, Harold: *See—*
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Groupment pour les Activities Atomiques et Avancees "GAAA": *See—*
Bourree, Rene; and Brin, Michel, 3,921,823.

Groux, Michel John Arthur: *See—*
Dalan, Ernesto; Groux, Michel John Arthur; and Hidalgo, Jaime, 3,922,375.

Grove, Robert H.: *See—*
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Grow, Bruce W.: *See—*
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Grow, Craig H.: *See—*
Grow, Harlow B., 3,921,599.

Grow, Harlow B., to Grow, Craig H.; and Grow, Bruce W., part interest to each. Fuel pump injection for compression ignition engines. 3,921,599, Cl. 123-25.00A.

Grubbs, Thomas M., Sr.: *See—*
Schnitzer, Emanuel; Grubbs, Thomas M., Sr.; and Nagy, Kornel, 3,921,713.

Gruner, Robert Walter, to Communication Satellite Corporation. 6-Port directional orthogonal mode transducer having corrugated waveguide coupling for transmit/receive isolation. 3,922,621, Cl. 333-11.000.

Gryctko, Carl E.: *See—*
Buxton, Aldon L.; Donnerstag, Leonard; and Gryctko, Carl E., 3,922,586.

GTE Automatic Electric (Canada) Limited: *See—*
Borbas, Robert A.; Dufton, John P.; and Foster, James H., 3,922,644.
Lighthall, John T.; and Shaver, David M., 3,922,653.

GTE Automatic Electric Laboratories Incorporated: *See—*
Athas, Gregory R.; Draayer, Johannes; Malfese, William F.; Reynolds, Nigel J. E.; and Potenza, George W., 3,922,499.
Zimmermann, Joseph J., 3,922,717.

GTE Laboratories Incorporated: *See—*
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Hutter, Rudolf G. E., 3,922,580.

GTE Sylvania Incorporated: *See—*
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Pitel, Ira Jay, 3,922,582.
Poole, Margaret A., 3,922,643.
Smithgall, Harry E., 3,921,269.
Wheeler, Robert Charles, 3,922,713.
Wilson, Robert F., 3,922,578.

Guarderas, G. Emilio. Silencer against toxic gases. 3,921,397, Cl. 60-303.000.

Gudmestad, Ragnar; and Gorski, Leon J., to Artos Engineering Company. Rotary wire stripper. 3,921,472, Cl. 81-9.510.

Guenther, Dennis K.: *See—*
Broughton, Stanley A.; and Guenther, Dennis K., 3,921,998.

Guidry, Mark R., Jr.: *See—*
Cunningham, James A.; Wakefield, Robert H., Jr.; and Guidry, Mark R., Jr., 3,921,282.

Gulf Oil Canada Limited: *See—*
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Gull Airborne Instruments, Inc.: *See—*
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Gunn, Kenneth M.: *See—*
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Gustmann, Kurt; and Sourisseaux, Ludwig, to Pfaff Industriemaschinen GmbH. Lock stitch sewing machine having a rotatable shuttle. 3,921,551, Cl. 112-181.000.

Gustmann, Kurt; and Sourisseaux, Ludwig, to Pfaff Industriemaschinen GmbH. Lock stitch rotating shuttle. 3,921,553, Cl. 112-228.000.

Guth, Lauren W., to General Electric Company. Hinge assembly for a dishwasher door. 3,921,252, Cl. 16-142.000.

H. B. Zachry Co.: *See—*
Schnitzer, Emanuel; Grubbs, Thomas M., Sr.; and Nagy, Kornel, 3,921,713.

H. F. Henderson Industries: *See—*
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H.T. Golde GmbH: *See—*
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H. W. Jenkins Co.: *See—*
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Haase, Reinhold A.: *See—*
Brockelsby, Norman D.; and Haase, Reinhold A., 3,921,958.

Habert, Roger, to Ducellier & Cie. Ignition device for an internal combustion engine. 3,921,606, Cl. 123-148.00E.

Hackenberg, Robert A., to Robertson Paper Box Co., Inc. Lock bottom compartmented box. 3,921,894, Cl. 229-27.000.

Hacoba Textilmaschinen GmbH & Co. KG: *See—*
Rosenkranz, Dieter; Bous, Karl; Schmidt, Roland; Engelhardt, Werner; and Vermehren, Gunter, 3,921,419.

Haddad, Joseph J., Jr., to Lunkenheimer Company, The. Positioning assembly for valve closure members. 3,921,955, Cl. 251-297.000.

Haenni & Cie Aktiengesellschaft: *See—*
Staubli, Alfons; and Weber, Hans, 3,921,455.

Hafer, Paul M., to Arrow-Hart, Inc. Plug-in bus duct. 3,922,053, Cl. 339-22.00B.

Hagen, Donald H. Gear unit with disconnect clutch. 3,921,774, Cl. 192-85.0CA.

Hagen, Hermann, to Motoren- und Turbinen-Union Munchen GmbH. Rotor for flow machines. 3,922,109, Cl. 416-213.000.

Hagen, Rolf: *See—*
Murawski, Kurt; Hagen, Rolf; Heitzig, Claus-Peter; and Weiss, Jurgen, 3,922,056.

Hagman, Harry C. Safety cigarette holder. 3,921,645, Cl. 131-182.000.

Haji, Junzo: *See—*
Onoda, Takeru; Yamura, Akira; Ohno, Akihisa; Haji, Junzo; Toriya, Jun; Sata, Masato; and Ishizaki, Naoatsu, 3,922,300.

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Halfhill, Martin O.; and Brunner, Russell K. Disc drive linear actuator and control system therefor. 3,922,718, Cl. 360-78.000.

Hall, George R., II: *See—*
Bates, David A.; Christopher, Gary L.; and Hall, George R., II, 3,922,688.

Hall, John B.: *See—*
Schreiber, William Lewis; Vock, Manfred; Hall, John B.; Shuster, Edward Joseph; and Quinn, Alton Dewitt, 3,922,237.

Hall, Mary Irene. Folding trailer corral. 3,921,585, Cl. 119-20.000.

Hall, Patrick H.; and Oliver, David W., to United States of America, Navy. Combustor wing vortex generators. 3,921,391, Cl. 60-39.72R.

Hall, Samuel Stewart, to Plessey Handel und Investments A.G. Electromagnetic relays. 3,922,625, Cl. 335-196.000.

Hall Ski-Lift Company, Inc.: *See—*
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Hallada, Thomas C.; Inamine, Edward; and Birnbaum, Jerome, to Merck & Co., Inc. Fermentation process. 3,922,202, Cl. 195-80.00R.

Haller, Hans; and Wendl, Erwin. Mold for concrete C-profiles including a removeable core. 3,922,135, Cl. 425-432.000.

Halliburton Company: *See—*
Misak, Marvin D., 3,922,173.

Halloran, John B., to United Merchants and Manufacturers Inc. Process for obtaining flocked fabrics and fabrics obtained therefrom. 3,922,410, Cl. 428-88.000.

Hama, Tetsuro, to Kabushiki Kaisha Suwa Seikosha. Driving circuits for electronic watches. 3,922,568, Cl. 307-223.00C.

Hamer, Floyd S. Rotary balancer. 3,921,462, Cl. 73-482.000.

Hamilton, Clair. Electronic furnace control system. 3,921,899, Cl. 236-9.00A.

Hamilton, Clark B.; Moody, Harold W., Jr.; and Schaefer, Donald D., to Dunham-Bush, Inc. Hermetic rotary helical screw compressor with improved oil management. 3,922,114, Cl. 417-366.000.

Hamilton Technology, Inc.: *See—*
James, John Oliver, 3,921,295.

Hammann, Ingeborg: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,922,324.

Hammer, Klaus-Dieter; and Klenk, Ludwig, to Hoechst Aktiengesellschaft. Manufacture of a reinforced, non-woven textile fiber sheet material. 3,922,419, Cl. 428-198.000.

Hammond, Frank Walter: *See—*
Lowrey, Orvey Preston, Jr.; Hammond, Frank Walter; and Slack, Raymond Bender, 3,922,207.

Hampel, Daniel; and Blasco, Richard William, to RCA Corporation. Multionomial processor system. 3,922,536, Cl. 235-152.000.

Hamrock, Edward M.; and Pressler, Earl David, to Enterprise Products, Inc. Supporting device. 3,921,812, Cl. 211-60.00T.

Hanamura, Tosiki: *See—*
Nishio, Yasuhiro; Yonekubo, Hirosi; Matuzawa, Takeo; Hanamura, Tosiki; and Ishibayashi, Kunimoto, 3,921,336.

Hanley, James A. Method of adhesion of surfaces especially as applied to corrugated paper boards. 3,921,368, Cl. 53-47.000.

Hanning, Robert; and Neumann, Gernot. Apparatus for raising the end of a bed mattress. 3,921,230, Cl. 5-68.000.

Hanns, Paul: *See—*
Feger, Herbert; and Hanns, Paul, 3,921,962.

Hanson, James T.: *See—*
Gingras, Gerard J., Jr.; and Hanson, James T., 3,922,674.

Hanvey, William E.: *See—*
Ayers, Bobby R.; Sanders, Bobby G.; and Hanvey, William E., 3,921,924.

Hapgood, William H., to Raytheon Company. Home freezing appliance. 3,921,961, Cl. 259-67.000.

Hardenbicker, Herbert: *See—*
Jores, Willi; Hoffacker, Franz; Kreit, Bernhardt; Lehmann, Helmut; and Hardenbicker, Herbert, 3,921,523.

Harding, Wayne M.; Williams, Neal M.; and LeCocq, Andrew D., to Texas Instruments Incorporated. Watch having positioned controlled display actuator with delay. 3,921,385, Cl. 58-23.00R.

Hardy, Albert L.: *See—*
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Hargett, Richard L.: *See—*
Faulstich, Albert J., Jr.; and Hargett, Richard L., 3,921,528.

Harker, Louis Meade; and Valle, Thomas, to Jaconvel Company. Method for direct reduction of iron ore using sleeve-shaped briquettes. 3,922,165, Cl. 75-36.000.

Harper, Patrick D.; Knight, Theodore L.; Slavin, Michael; and Ingels, Ward A., to Bendix Corporation, The. Fluid level monitor. 3,922,658, Cl. 340-244.00R.

Harries, David Anthony, to Girling Limited. Vehicle hydraulic braking system with independent brake circuits. 3,922,023, Cl. 303-21.00F.

Harris, Jesse P. T., Jr.: *See—*
Champion, Robert J.; Palm, Ronald K.; Harris, Jesse P. T., Jr.; and Kivett, William D., 3,921,821.

Harris, William H. Dental drill swivel. 3,921,296, Cl. 32-27.000.

Hartig, Gunter. Method and system for producing a signal determining the value and phase position of the closing angle of an internal combustion engine. 3,921,610, Cl. 123-117.00R.

Hartl, Walter, to International Standard Electric Corporation. Combined wire-stripping and wrapping tool. 3,921,275, Cl. 29-203.00H.

Hartmann, Hans-Joerg; Hartmann, Job-Werner; Frischman, Harald; and Vaeth, Guenter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Magnetic recording media. 3,922,439, Cl. 428-425.000.

Hartmann, Job-Werner: *See—*
Hartmann, Hans-Joerg; Hartmann, Job-Werner; Frischman, Harald; and Vaeth, Guenter, 3,922,439.

Hartmann, Manfred: *See—*
Braun, Josef; Hartmann, Manfred; and Oesterle, Helmut, 3,921,495.

Hasegawa, Shigeki, to Feather Kogyo K.K. Bladed cutting tool with removable and replaceable blade. 3,921,289, Cl. 30-338.000.

Hasegawa, Yoshisuke, to Mitsubishi Corporation. Process for the production of fish flour having gel-forming ability. 3,922,372, Cl. 426-574.000.

Hashizume, Kazumoto; and Watanabe, Tokuji, to Director of National Food Research Inst. Methods of producing protein materials. 3,922,359, Cl. 426-574.000.

Hatt, Raymond J. Plant feeder. 3,921,914, Cl. 239-567.000.

Hattori, Seiji; and Kimura, Tomio, to Daido Seiko Kabushiki Kaisha. Method for joining steel bars. 3,921,281, Cl. 29-520.000.

Hauffe, William L.; and Saha, Narayan C., to Mueller Co. Meter box for fluid meter equipment. 3,921,449, Cl. 73-273.000.

Hauffe, William L.; and Saha, Narayan C., to Mueller Co. Plastic pipes and/or fittings with excessive flow safety valves. 3,921,662, Cl. 137-517.000.

Hauk, Ernest D. Apparatus and method for leak testing of tool joints between drill pipe sections. 3,921,437, Cl. 73-40.50R.

Hauni-Werke Korber & Co. KG: *See—*
Bornfleth, Ulrich; and Selonke, Fritz, 3,921,791.
von der Lohe, Joachim; Gretz, Heinz; and Heitmann, Uwe, 3,921,644.

Hauser, Raimund: *See—*
Schild, Josef, 3,922,076.

Hawaiian Sugar Planters' Association: *See—*
McElhoe, Bruce A.; and Tabrah, Joseph G., 3,921,905.

Hayakawa, Michitaro, to Kabushiki Kaisha Seidensha. Object detection system having fault detection function. 3,922,629, Cl. 340-1.00R.

Hayami, Heijiro: *See—*
Sasabe, Kaoru; Okino, Yoshihiro; and Hayami, Heijiro, 3,922,711.

Hayano, Ichiro: *See—*
Kawasaki, Shigetake; Owa, Masaru; Hayano, Ichiro; Akiya, Takaji; Takeuchi, Norio; Goto, Totaro; and Ishizaka, Seiichi, 3,922,154.

Hayashi, Masaharu; and Fujita, Saburo, to Aisin Seiki Kabushiki Kaisha. Fluid coupling. 3,921,772, Cl. 192-58.00B.

Hayashi, Masaki; Kori, Seiji; and Iguchi, Yoichi, to Ono Pharmaceutical Co., Ltd. Sulphonic acid derivatives of prostaglandins. 3,922,301, Cl. 260-503.000.

Hayashida, Yoshihiro; and Suzuki, Hiroyuki, to Tokico Ltd. Low liquid level warning device. 3,922,657, Cl. 340-244.00E.

Haybro Co.: *See—*
Fogelgren, John E., 3,921,614.

Hayes, Jerry R.; and Bruninga, Kenneth J., to L. R. Nelson Corporation. Pop-up sprinkler with multiple-purpose one-piece seal. 3,921,910, Cl. 239-205.000.

Hayes, Jerry R., to L. R. Nelson Corporation. Lawn sprinkler. 3,921,912, Cl. 239-242.000.

Hazelett Strip-Casting Corporation: *See—*
Petry, Charles J., 3,921,697.

Hazeltine Corporation: *See—*
Kumpebeck, Richard J., 3,922,683.

Hazen, Stanley M.; and Heilman, William J., to Gulf Research & Development Company. Handleable, moldable ester-type resin compositions. 3,922,247, Cl. 260-40.00R.

Heath, Darrell R.; and Williams, Frank J., III, to General Electric Company. N-Substituted aromatic thioetherophthalimides. 3,922,284, Cl. 260-326.00S.

Heath, Stephen D.; and Borbolla, Lorenzo, Jr., to Rohr Industries, Inc. Vapor recovery apparatus employing dispensing nozzle with condensing capacity. 3,921,412, Cl. 62-54.000.

Hebeda, Ronald Emil; Holik, Dennis John; and Leach, Harry Woods, to CPC International Inc. Enzymatic hydrolysis of granular starch. 3,922,199, Cl. 195-31.00R.

Hebeda, Ronald Emil; and Leach, Harry Woods, to CPC International Inc. Preparation of levulose from granular starch. 3,922,201, Cl. 195-31.00F.

Hebeda, Ronald Emil: *See—*
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Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, 3,922,197.

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Hedrick, Ross Melvin; and Gabbert, James D., to Monsanto Company. Catalytic process for imide-alcohol condensation. 3,922,254, Cl. 260-78.00E.

Heil, Charles W. Ski storing, protecting, and carrying apparatus. 3,921,871, Cl. 224-45.00S.

Heilman, William J.: *See*—
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Heitzig, Claus-Peter: *See*—
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Hejmanowski, Henry P., to A W & H Manufacturing Co., Inc. Conveyer sorter apparatus. 3,921,786, Cl. 198-38.000.

Helderman, J. Frank. Fastener assembly. 3,921,496, Cl. 85-83.000.

Helicorporation: *See*—
Garfinkle, Marvin, 3,921,939.

Heller, Adam, to GTE Laboratories Incorporated. Electrochemical cell. 3,922,174, Cl. 136-6.0LN.

Hellmuth, Walter W.; Foucher, Walter D., Jr.; and Siegart, William R., to Texaco Inc. Antioxidant heterocyclic nitrogenous aromatic containing oil compositions. 3,922,227, Cl. 252-32.70E.

Helmick, James C., to Victor Comptometer Corporation. Takedown bow limb-handle assembly. 3,921,598, Cl. 124-24.00R.

Hengstler, Heinz; and Groll, Robert M., to Hecon Corporation. Control device. 3,921,875, Cl. 235-92.0CT.

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Henley, Louis L. Chain saw bow. 3,921,291, Cl. 30-382.000.

Hennenberg, Wilhelm Friedrich: *See*—
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Henning, Richard; and Schweiger, Erwin, to Bayerische Motoren Werke Aktiengesellschaft. Circulating cooling system for piston internal combustion engines. 3,921,600, Cl. 123-41.540.

Henry, Arthur Charles, to Shell Oil Company. Pyridine insecticides. 3,922,242, Cl. 260-296.00R.

Henry, Nelson R., to Woodman Company, Inc., The. Web roll cradle with positive drive. 3,921,928, Cl. 242-75.430.

Herbst, Richard L.: *See*—
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Herpich, William A., to Peabody Galion Corporation. Packing and ejecting means for a refuse truck. 3,921,839, Cl. 214-302.000.

Hertel, Hasso, to Hoechst Aktiengesellschaft. Process for the preparation of acid nitro dyestuffs. 3,922,270, Cl. 260-396.00R.

Hertz, Robert F.: *See*—
Denniston, William B.; and Hertz, Robert F., 3,922,617.

Herz, Harry. Power generator. 3,922,012, Cl. 290-43.000.

Hess, Hans-Jurgen E.: *See*—
Lipinski, Christopher A.; Stam, John G.; DeAngelis, Gerald G.; and Hess, Hans-Jurgen E., 3,922,345.

Hess, Rainer. Muffler having a connection between its disks and the tube lengths extending therethrough. 3,921,754, Cl. 181-35.00R.

Hewitt, Lew V.; and Horton, Dee D., Jr., to Overhead Door Corporation. Air operated door opener. 3,921,335, Cl. 49-265.000.

Heyden, Rudi; and Asbeck, Adolf, to Henkel & Cie GmbH. Process of impregnating leather and leather substitute materials. 3,922,446, Cl. 428-473.000.

Hickey, Richard C.; Bond, John H.; and Watson, Tandy P., to Docutel Corporation. Lead screw document transport. 3,921,969, Cl. 271-3.000.

Hidalgo, Jaime: *See*—
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Hieb, Arthur J. Irrigation system. 3,921,909, Cl. 239-177.000.

Higashikuze, Michiaki: *See*—
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Higgins, Francis J., to United States of America, Navy. Insulated conductor detector. 3,922,633, Cl. 340-4.00R.

Higo, Akio: *See*—
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Higuchi, Takeshi: *See*—
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Hill, John W.; and Sword, Antony J., to Stanford Research Institute. Force and torque sensing method and means for manipulators and the like. 3,921,445, Cl. 73-133.00R.

Hills, William H.: *See*—
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Hilti Aktiengesellschaft: *See*—
Braun, Josef; Hartmann, Manfred; and Oesterle, Helmut, 3,921,495.
Schmuck, Peter, 3,921,729.

Hinchcliffe, Dennis; and Clarke, Peter Alec, to Molins Limited. Conveying of cigarettes and other rod-like articles. 3,921,790, Cl. 198-37.000.

Hinderks, Mitja Victor. Bumper mounting. 3,922,014, Cl. 293-88.000.

Hinrichs, John Michael, to TRW Inc. Shaft sealing means for butterfly valve. 3,921,956, Cl. 251-306.000.

Hinves, John R.: *See*—
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Hirashima, Masayoshi, to Matsushita Electric Industrial Co., Ltd. Recording and reproducing apparatus for video signals using a video storage tube and an audio tape recording device. 3,922,715, Cl. 360-9.000.

Hirato, Motohide. Pipe clasper. 3,922,103, Cl. 403-397.000.

Hiratsuka, Toshio, to Fuji Xerox Co., Ltd. Detector for use with a duplicator or the like for detecting incorrectly aligned documents. 3,922,662, Cl. 340-259.000.

Hirohashi, Toshiyuki: *See*—
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Hisamitsu Pharmaceutical Co., Inc.: *See*—
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Hisatomi, Shigenobu: *See*—
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Hitachi, Ltd.: *See*—
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Hofer, Walter David. Snap-on tine tooth. 3,921,376, Cl. 56-400.000.

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Hogstrom, Edwin F.; and Vilagi, Burton J., to Nordson Corporation. Apparatus for striping inside seams of cans. 3,921,570, Cl. 118-2.000.

Holcombe, Gordon B. Luminescent fishing lure. 3,921,328, Cl. 43-17.600.
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Hollman, George A. Rib cage protector pad. 3,921,222, Cl. 2-2.000.
Hollyoak, John David, to Lucas Electrical Company Limited, The. Starter motors. 3,922,558, Cl. 290-38.00A.
Holmstrom, Rodger L. Measuring pour spout. 3,921,862, Cl. 222-305.000.
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Horton, James F., Sr.; Horton, Thomas J.; and Horton, James F., Jr. Harvester with digging head and root crop washer. 3,921,724, Cl. 171-117.000.
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Hosoda, Toru; and Seki, Mitsuru, to Nissan Motor Company Limited. Apparatus for converting rotary to linear reciprocating motion with a decelerated portion in its stroke. 3,921,465, Cl. 74-52.000.
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Hovey, Frederick A.; and Torsch, Charles E., to GTE Sylvania Incorporated. Wide angle deflection yoke quadrupole windings. 3,922,626, Cl. 335-213.000.
Howard, Mig Allen, to Hughes Tool Company. Drilling force indicator. 3,921,447, Cl. 73-151.000.
Howard, Willard L.; and Tietjen, Thomas A., to Xerox Corporation. Magnetic development units. 3,921,577, Cl. 118-637.000.
Howard, Willis W., to Exxon Production Research Company. Apparatus for detecting valve failure in a reciprocating pump. 3,921,435, Cl. 73-40.000.
Howden, Harry, to U.S. Philips Corporation. Method of manufacture of optical elements. 3,922,327, Cl. 264-1.000.
Howlett, George H.; and Howlett, James W., to Howlett Machine Works. Tendon anchorage assembly and bore mounting apparatus therefor. 3,921,353, Cl. 52-223.000.
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Huch, Richard O.; and Valles, Pedro, to Pima Mining Company. Talc-molybdenite separation. 3,921,810, Cl. 209-167.000.
Hudson, John M.; and Axley, John E., to General Electric Company. Strain gage. 3,922,628, Cl. 338-2.000.
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Hutchinson, Richard H., deceased; and by Hutchinson, Claire T., executrix, to Goodman, Sigmund; and Goodman, Elliot L., part interest to each. Reversible belt tensioning system. 3,921,793, Cl. 198-208.000.
Hutchinson, William M., to Phillips Petroleum Company. Azeotropic composition consisting of difluoromethyl trifluoromethylether and dimethyl ether. 3,922,228, Cl. 252-67.000.
Hutter, Rudolf G. E., to GTE Laboratories Incorporated. Simultaneous electrostatic focusing and deflection system. 3,922,580, Cl. 313-427.000.
Hyde, Geoffrey, to Communications Satellite Corporation (COMSAT). Aberration correcting subreflectors for toroidal reflector antennas. 3,922,682, Cl. 343-761.000.
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Ikegami, Yoshizo; and Miyauchi, Akio, to Fuji Photo Film Co., Ltd. Information storage and retrieval. 3,922,074, Cl. 350-320.000.
Ikegaya, Kazuo: *See—*
Okada, Hiroshi; Horibe, Hiroshi; Mizuno, Yasushi; Yasui, Shoji; Ikegaya, Kazuo; and Suzumura, Nobuo, 3,921,623.
Iles, Thomas L.: *See—*
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Fisher, Julian Vernon, 3,921,261.
Imamura, Nobutake; and Kobayashi, Toshihiko, to Kokusai Denshin Denwa Kabushiki Kaisha. Memory device using ferromagnetic substance lines. 3,922,651, Cl. 340-174.0TF.
Imperial Chemical Industries Limited: *See—*
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Campbell, John Stewart; Craven, Patrick; and Davies, Phineas, 3,922,337.
Entwisle, John Hubert, 3,922,226.
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In-Line Technology: *See—*
Bok, Hendrik Frederik; and St. Onge, Eugene Raymond, 3,921,796.

Ina Seito Co., Ltd.: *See—*
Noritake, Muneo; and Takeuchi, Masaharu, 3,922,140.

Inaba, Shigeho: *See—*
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,922,264.

Inami, Mamoru; Tanaka, Yoshiaki; and Ono, Tsuyoshi, to Victor Company of Japan, Limited. Signal level displaying apparatus. 3,922,666, Cl. 340-324.00M.

Inamine, Edward: *See—*
Hallada, Thomas C.; Inamine, Edward; and Birnbaum, Jerome, 3,922,202.

Inao, Kiyohisa: *See—*
Goto, Naohiro; Izozaki, Yukinao; Shidara, Keiichi; Maruyama, Eiichi; Hirai, Tadaaki; Inao, Kiyohisa; and Mori, Ikue, 3,922,579.

Independent Broadcasting Authority: *See—*
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Indian Head Inc.: *See—*
Trieunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,921,380.

Indri, Luigi, to Thorn Electrical Industries Limited. Tunable television receiver circuits with automatic phase control. 3,922,483, Cl. 178-5.8AF.

Inductosyn Corporation: *See—*
Tripp, Robert W., 3,922,671.

Industrial Development Bank: *See—*
Diener, Erhard Armin, 3,921,953.

Industrie Pirelli S.p.A.: *See—*
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Information Storage Systems, Inc.: *See—*
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Ingels, Ward A.: *See—*
Harper, Patrick D.; Knight, Theodore L.; Slavin, Michael; and Ingels, Ward A., 3,922,658.

Ingham, John Milton; and Reslow, Lloyd Frederick, to Brown & Sharpe Manufacturing Company. Collet chucking assembly. 3,921,993, Cl. 279-50.000.

Ingram, Robert F., III, to Covington Industries, Inc. Garments for motorcycling. 3,921,224, Cl. 2-93.000.

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Inotech Process Limited: *See—*
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Toyoda, Takashi; Fukada, Tadayuki; Inoue, Masayuki; Takayama, Shigeru; Yui, Hiroshi; and Inoue, Takayuki, 3,922,427.

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Brunner, Rolf H.; Carbone, Quiedo J.; and Lester, William C., 3,921,572.
Crowder, Billy L.; and Tan, Swie-In, 3,922,708.
Freed, Larry E.; Nestork, William J.; and Tuman, Daniel, 3,922,707.
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International Flavors & Fragrances Inc.: *See—*
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International Standard Electric Corporation: *See—*
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International Telephone and Telegraph Corporation: *See—*
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Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., to Monsanto Company. Article comprising a substrate coated with a cured powder resin composition comprising an aminoplast and a polyester or polyacrylic resin. 3,922,447, Cl. 428-474.000.

Isfort, Heinz; and Ilgner, Hans-Peter, to Friedrich Uhde GmbH. Process of avoiding mercury emission from mercury-using plants. 3,922,210, Cl. 204-99.000.

Ishibayashi, Kunimoto: *See—*
Nishio, Yasuhiro; Yonekubo, Hirosi; Matuzawa, Takeo; Hanamura, Tosiki; and Ishibayashi, Kunimoto, 3,921,336.

Ishida, Nobuyasu: *See—*
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Ishihara, Masamitsu. Fluid pressure-operated device. 3,921,399, Cl. 60-478.000.

Ishii, Mitsuaki: *See—*
Nabetani, Hiroshi; Ueda, Atsushi; Uota, Kosaku; and Ishii, Mitsuaki, 3,922,569.

Ishii, Sumio: *See—*
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Ishii, Yasunori; Kanbeshiyama, Kajime; Karakawa, Kouichi; and Yamada, Akiharu, to Mitsui Shipbuilding and Engineering Co., Ltd. Coating apparatus. 3,921,575, Cl. 118-322.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Takahashi, Masaoki; and Nishinomiya, Makoto, 3,921,831.

Ishimura, Mamoru, to Xerox Corporation. Resealable container. 3,921,896, Cl. 229-39.00R.

Ishizaka, Seiichi: *See—*
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Ishizumi, Kikuo: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,922,264.

Itaya, Nobushige: *See—*
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Itek Corporation: *See—*
Genthe, James E.; and Mayer, Edward F., 3,921,578.
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Ito, Florence A.: *See—*
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Ito, Yasumichi: *See—*
Asano, Yoshio; Kato, Kazunobu; Ito, Yasumichi; and Yoshida, Kazutaka, 3,922,700.

Itoh, Mitsuru: *See—*
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ITT Industries, Inc.: *See—*
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Keller, Hans, 3,921,386.

ITW Limited: *See—*
Fernberg, Paul C.; and Clinch, Colin W. F., 3,921,849.

Ivchenko, Wasil. Method of bonding cured rubber and acrylic resin useable in making a composite denture prosthesis. 3,921,292, Cl. 32-2.000.

Iwatsu Electric Co., Ltd.: *See—*
Takano, Toshiichi, 3,922,500.

Izozaki, Yukinao: *See—*
Goto, Naohiro; Izozaki, Yukinao; Shidara, Keiichi; Maruyama, Eiichi; Hirai, Tadaaki; Inao, Kiyohisa; and Mori, Ikue, 3,922,579.

J. I. Case Company: *See—*
Baker, Donald C.; Brewer, Lloyd A.; and Maurer, Herman J., 3,921,835.
Dunn, Donnell L., 3,921,748.

J.I.L. Corporation of America, Inc.: *See—*
Tsuji, Tom T., 3,922,047.

J. Sainsbury Limited: *See—*
Follett, Michael John, 3,922,358.

Jackson, Norman C., to Standard Products Company, The. Gasket with plastic molding. 3,922,460, Cl. 428-217.000.

Jackson, Philip C., to Instrumentation Engineering, Inc. Multiplex device for automatic test equipment. 3,922,537, Cl. 235-153.0AC.

Jaconvel Company: *See—*
Harker, Louis Meade; and Valle, Thomas, 3,922,165.

Jaeger: *See—*
Barbier, Pierre, 3,921,387.

Jahme, Hans-Joachim. Sheet take off device for printing or duplicating machines. 3,921,523, Cl. 101-232.000.

James, John Oliver, to Hamilton Technology, Inc. Orthodontic device. 3,921,295, Cl. 32-14.00E.

Janes, Norman Frank: *See—*
Elliott, Michael; Janes, Norman Frank; and Pulman, David Allen, 3,922,269.

Janin, Raymond; and Krumenacker, Leon, to Rhone-Poulenc S.A. Process for the preparation of anthraquinone. 3,922,290, Cl. 260-385.000.

Japan Foods Storage & Packaging Co., Ltd.: *See—*
Mitsuda, Hisateru; Kawai, Fumio; Kuga, Mutsuo; Saito, Fumitaka; and Yamamoto, Aijiro, 3,922,363.

Japan Steel Works Ltd.: *See—*
Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, 3,922,519.

Japanese National Railways: *See—*
Kitta, Toshiyuki; Miyata, Shohiko; Fukunaga, Tatsumi; and Kasahara, Mataichi, 3,922,437.

Javan, Ali, to Massachusetts Institute of Technology. Multiple transition laser. 3,922,618, Cl. 331-94.50M.

Jerabek & Associates Ltd.,: *See—*
Jerabek, Bohumil, 3,921,250.

Jerabek, Bohumil, to Jerabek & Associates Ltd.,. Suction cleaner air inlet device. 3,921,250, Cl. 15-353.000.

Jerabek, Robert D.; and Marchetti, Joseph R., to PPG Industries, Inc. Self-crosslinking cationic electrodepositable compositions. 3,922,253, Cl. 260-77.5TB.

Jhawar, Pannalal Sohanlal, to Imperial Chemical Industries Limited. Production of propenylnorbornene. 3,922,317, Cl. 260-668.0PX.

Joerns Furniture Company: *See—*
Damico, Frank M., 3,921,345.

Johansson, Karl-Gunnar Torbjorn: *See—*
Bergmark, Nils Randolf; and Johansson, Karl-Gunnar Torbjorn, 3,921,657.

Johansson, Sven Ingemar: *See—*
Ekwall, Carl Gosta Bernhard; and Johansson, Sven Ingemar, 3,921,731.

Johansson, Tage Hjalmar, to Kockum Industri Aktiebolag. Gang saw with improved cutting action. 3,921,489, Cl. 83-779.000.

John Laing & Son Limited: *See—*
Lowen, Michael David; and Newby, Ronald, 3,921,434.

Johnson, Edwin Lee: *See—*
Peniston, Quintin P.; and Johnson, Edwin Lee, 3,922,260.

Johnson, Glenn. Dredge pipe flotation. 3,921,238, Cl. 9-1.00R.

Johnson, James A.: *See—*
Letize, Raymond A.; and Johnson, James A., 3,922,511.

Johnson & Johnson: *See—*
Cepuritis, Talivaldis, 3,921,639.

Johnson, Keith G., to Arco Polymers, Inc. Method for making structural foam profiles. 3,922,328, Cl. 264-46.100.

Johnson, Larry A.; Robinson, Neil L.; Strang, Richard H.; and Vair, Gary G., to International Business Machines Corporation. Magnetic head surface formation apparatus and method. 3,921,340, Cl. 51-165.00R.

Johnson, Lloyd A. Precision seed planter. 3,921,852, Cl. 221-266.000.

Johnson, Rubein V. Acoustic ear mold for hearing aid. 3,921,756, Cl. 181-135.000.

Johnson, Walter E., to H. F. Henderson Industries. Segmented storage bin. 3,921,351, Cl. 52-197.000.

Johnston, David Ernest; and Russell, Peter John, to George Angus & Company Limited. Shaft seals. 3,921,987, Cl. 277-134.000.

Johnston, David Ernest; and Russell, Peter John, to George Angus & Company Limited. Shaft seals. 3,921,990, Cl. 277-182.000.

Johnston, John David: *See—*
Stiner, Roy E.; and Johnston, John David, 3,922,008.

Joice, Richard L. Arms for stacking machine. 3,921,827, Cl. 214-6.0FS.

Joiner, Walter Charles: *See—*
Jupe, Robert John; and Joiner, Walter Charles, 3,921,938.

Jonas Woodhead Limited: *See—*
Skerry, Peter, 3,921,965.

Jones, Gary Arthur, to RCA Corporation. Digital feedback relay controller. 3,922,587, Cl. 317-123.000.

Jones, Ivor Wynn: *See—*
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Jones & Laughlin Steel Corporation: *See—*
Koros, Peter J.; and Silver, Jerry, 3,922,166.

Jones, Paul H.: *See—*
Nute, Ernest B., Jr.; Jones, Paul H.; and Vasaturo, Frank J., 3,921,365.

Jones, Thomas E.: *See—*
Formica, Thomas D.; Greenwood, Robert C.; and Jones, Thomas E., 3,921,854.

Jordan, Merrill E.; and Morgan, Allan C., to Cabot Corporation. Process for producing carbon black. 3,922,335, Cl. 423-450.000.

Jores, Willi; Lehmann, Helmut; and Hoffacker, Franz, to Agfa-Gevaert Aktiengesellschaft. Winding shaft with variable torque. 3,921,926, Cl. 242-56.900.

Jores, Willi; Hoffacker, Franz; Kreit, Bernhardt; Lehmann, Helmut; and Hardenbicker, Herbert, to Agfa-Gevaert Aktiengesellschaft. Automatic band-winding machine. 3,921,929, Cl. 242-76.000.

Jos. Schneider & Co. Optische Werke: *See—*
Macher, Karl, 3,922,070.

Josephson, Edgar F.: *See—*
Fleshman, James W.; Josephson, Edgar F.; and Stoller, David A., 3,921,537.

Julien, Fred E., Sr.; Raithel, Elmer A.; and Shafer, Carl W., to Caterpillar Tractor Co. Portable container emptying apparatus. 3,921,840, Cl. 214-310.000.

Julien, Neal B. Method of preparing an ice confection and the resulting product. 3,922,371, Cl. 426-565.000.

Julius Blum & Co., Inc.: *See—*
Seery, Robert F., 3,922,453.

Jupe, Robert John; and Joiner, Walter Charles, to Westland Aircraft Limited. Helicopters. 3,921,938, Cl. 244-17.110.

Kabelschlepp Gesellschaft mit beschrankter Haftung: *See—*
Loos, Kurt; and Moritz, Werner, 3,921,388.

Kabushiki Kaisha Seidensha: *See—*
Hayakawa, Michitaro, 3,922,629.

Kabushiki Kaisha Suwa Seikosha: *See—*
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Katayama, Shigeo; Sato, Katsunori; Miyagawa, Tomoyuki; Takahashi, Hisateru; Kato, Takashi; Yoshizawa, Toshio; and Yamada, Yasuo, 3,921,921.
Tooka, Takuzo, 3,922,642.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,922,405.
Nagase, Hiroshi, 3,922,597.

Kachuk, Paul T.; and Karst, Ronald E. Liquid level control. 3,922,564, Cl. 307-118.000.

Kaera, Kaarel: *See—*
Clippard, William L., Jr.; and Kaera, Kaarel, 3,921,670.

Kaes, Hans-Herbert: *See—*
Broemer, Heinz; Kaes, Hans-Herbert; and Pfeil, Emanuel, 3,922,155.

Kageyama, Bunji: *See—*
Sonoyama, Takayasu; Kageyama, Bunji; and Honjo, Tahiko, 3,922,194.

Kaiser, Reinhold, to Telefunken Patentverwertungsgesellschaft m.b.H. Transistor having emitter with high circumference-surface area ratio. 3,922,706, Cl. 357-36.000.

Kaiser Steel Corporation: *See—*
Powers, Joseph E., 3,921,850.

Kalsbeck, Marvin L.; and Kurkela, Glendon P. Bale transfer and feeder. 3,922,036, Cl. 298-18.000.

Kamata, Sachio: *See—*
Furuse, Takashi; and Kamata, Sachio, 3,921,705.

Kamezawa, Norimasa: *See—*
Murao, Kenji; Toriyama, Kazuhisa; Kamezawa, Norimasa; and Kitamura, Teruo, 3,922,067.

Kamiya, Kunio: *See—*
Yusa, Hideo; Kamiya, Kunio; Murata, Toshifumi; Yamaki, Hideo; and Hisatomi, Shigenobu, 3,922,150.

Kanbeshiyama, Kajime: *See—*
Ishii, Yasunori; Kanbeshiyama, Kajime; Karakawa, Kouichi; and Yamada, Akiharu, 3,921,575.

Kaneko, Yasuhisa: *See—*
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; Kondo, Katsumi; Morita, Akiyoshi; Koyama, Mototsugu; Sato, Mitsuyoshi; and Miyazaki, Shoji, 3,922,234.

Kanitz, Bruce R., to Xerox Corporation. Facsimile carrier detect circuit. 3,922,611, Cl. 328-111.000.

Kanzaki Paper Mfg. Co. Ltd.: *See—*
Masaoka, Takashi; Watanabe, Noritoshi; Takegawa, Yasuo; and Kitahori, Tojiro, 3,922,463.

Kao Soap Co., Ltd.: *See—*
Takaku, Masaaki; and Kawahito, Shiro, 3,922,306.

Kapteijn, Steven A. T.; and Raynes, John H., to Shell Oil Company. Floating storage unit. 3,921,557, Cl. 114-.50T.

Karakawa, Kouichi: *See—*
Ishii, Yasunori; Kanbeshiyama, Kajime; Karakawa, Kouichi; and Yamada, Akiharu, 3,921,575.

Karpuk, Philip; and Karpuk, Philip Edward. Dust guard for journal box. 3,922,039, Cl. 308-36.100.

Karpuk, Philip Edward: *See—*
Karpuk, Philip; and Karpuk, Philip Edward, 3,922,039.

Karst, Ronald E.: *See—*
Kachuk, Paul T.; and Karst, Ronald E., 3,922,564.

Kasahara, Mataichi: *See—*
Kitta, Toshiyuki; Miyata, Shohiko; Fukunaga, Tatsumi; and Kasahara, Mataichi, 3,922,437.

Kase, Heino, to Varian Associates. Liquid development of electrostatic images. 3,921,580, Cl. 118-637.000.

Kashmerick, Gerald E., to Outboard Marine Corporation. Exhaust manifold with high rise water tube. 3,921,398, Cl. 60-310.000.

Katayama, Masayoshi, to Tokico Ltd. Heat pipe and manufacturing method thereof. 3,921,710, Cl. 165-105.000.

Katayama, Shigenari: *See—*
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.

Katayama, Shigeo; Sato, Katsunori; Miyagawa, Tomoyuki; Takahashi, Hisateru; Kato, Takashi; Yoshizawa, Toshio; and Yamada, Yasuo, to Daiwa Boseki Kabushiki Kaisha; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Winding mechanism for making yarn packages of a cylindrical form in a textile machine. 3,921,921, Cl. 242-18.0DD.

Kato, Kazunobu: *See—*
Asano, Yoshio; Kato, Kazunobu; Ito, Yasumichi; and Yoshida, Kazutaka, 3,922,700.

Kato, Tadaaki: *See—*
Kuno, Masanori; and Kato, Tadaaki, 3,921,923.

Kato, Takashi: *See—*
Katayama, Shigeo; Sato, Katsunori; Miyagawa, Tomoyuki; Takahashi, Hisateru; Kato, Takashi; Yoshizawa, Toshio; and Yamada, Yasuo, 3,921,921.

Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Aryl ketones and production thereof. 3,922,266, Cl. 260-240.00J.

Katsuta, Kihei, to Mitsubishi Jukogyo Kabushiki Kaisha. Low temperature liquid storage tank of the internal heat insulating type having crack detecting means. 3,921,438, Cl. 73-40.700.

Kattis, Theodore. Flake ice maker. 3,921,415, Cl. 62-354.000.

Katz, Howard; and Ganslaw, Stuart H., to National Starch and Chemical Corporation. Absorbent nonwoven fabrics. 3,922,462, Cl. 428-290.000.

Katz, Lyber, to Tubeco, Inc. Feed mechanism for an end-bevel machine. 3,921,479, Cl. 82-21.00A.

Katz, Otto, to A. W. Faber-Castell. Mechanical pencil. 3,922,098, Cl. 401-94.000.

Kaul, Pradman P.: *See—*
Gabbard, Ova Gene; Husted, John M.; Kaul, Pradman P.; Werth, Andrew M.; and Walker, Andrew M., 3,922,496.

Kawada, Shoji, to Aisin Seiki Kabushiki Kaisha. Anti-crash radiodetector system for automotive vehicle. 3,921,749, Cl. 180-98.000.

Kawaguchi, Katsuyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Method and apparatus for combustion with the addition of water. 3,921,389, Cl. 60-39.050.

Kawaguchi, Munetake; and Nakabayashi, Hirohiko, to Sumitomo Electric Industries, Ltd. Solderable and thermostable insulated wires. 3,922,465, Cl. 428-383.000.

Kawahito, Shiro: *See—*
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Kawanobe, Toru; and Otsuka, Kanji, to Hitachi, Ltd. Chemical plating method. 3,922,400, Cl. 427-265.000.

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Kawata, Masayuki, to Toyo Kogyo Co., Ltd. Engine exhaust gas purifying means. 3,921,395, Cl. 60-282.000.

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Killion, Leonard H.; and Blair, E. J. Means for forming metal parts. 3,921,707, Cl. 164-305.000.

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King, John O., Jr. Method of forming an insert in a workpiece for receiving a threaded fastener. 3,921,280, Cl. 29-509.000.

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Kishikawa, Kenichiro; and Honda, Yougi, to Foster Electric Co., Ltd. Electroacoustic transducer. 3,922,504, Cl. 179-115.5PV.

Kishikawa, Toshiro; Yoshikawa, Kazuo; Yamauchi, Toshiro; and Higuchi, Takeshi, to Fuji Photo Optical Co., Ltd. Color separating prism system. 3,922,069, Cl. 350-173.000.

Kishimoto, Juji; and Mikada, Hiroyuki, to Canon Kabushiki Kaisha. Liquid-crystal indicator driving system. 3,922,668, Cl. 340-336.000.

Kiss, Ferenc; Grein, Wilhelm; and Zellmann, Karl, to Hoechst Aktiengesellschaft. Process and device for separating contaminated gas. 3,922,151, Cl. 55-92.000.

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Kodama, Yukuo; and Ando, Tsuyoshi, to Nippon Electric Co., Inc. Dynamic binary counter circuit. 3,922,566, Cl. 307-220.00C.

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Kohlbeck, Orin J., to American Air Filter Company, Inc. Air conditioning unit with reheat. 3,921,413, Cl. 62-173.000.

Kohlschutter, Hans Wolfgang; Unger, Klaus; and Schick-Kalb, Jurgen, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for coating nonporous material with a porous silicon dioxide layer. 3,922,392, Cl. 427-215.000.

Koike, Susumu, to Matsushita Electronics Corporation. Semiconductor memory device. 3,922,710, Cl. 357-54.000.

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Koleske, Joseph Victor; Whitworth, Clyde Jesse, Jr.; and Lundberg, Robert Dean, to Union Carbide Corporation. Cellulose esters or ethers blended with cyclic ester polymers. 3,922,239, Cl. 260-13.000.

Koloc, Paul M., to United States of America, Navy. Sensitized video phosphor motion perception display. 3,922,554, Cl. 250-461.000.

Kolozsvary, Arpad. Structural component and structures comprising the same. 3,921,349, Cl. 52-81.000.

Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for forming of a carbide layer of a V-a group element of the periodic table on the surface of an iron, ferrous alloy or cemented carbide article. 3,922,405, Cl. 427-399.000.

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Konantz, Mark L.; and Leisure, Ronald K., to General Motors Corporation. Solderable multilayer contact for silicon semiconductor. 3,922,385, Cl. 427-90.000.

Kondo, Hirosi. Pressure accumulative spray device. 3,921,861, Cl. 222-257.000.

Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, to Toyota Jidosha Kabushiki Kaisha. Method of filling a casing with heat insulating fibers. 3,921,273, Cl. 29-157.000.

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Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; and Saito, Mitsutaka, to Toyo Soda Manufacturing Co., Ltd. Laminated film. 3,922,473, Cl. 428-463.000.

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Kozak, Zdenek Vaclav; and Stupecky, Joseph Jaromir, to Kozak, Zdenek. Bidirectional spirometer. 3,922,525, Cl. 250-231.00R.

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Kretchman, Gerald L.; and Ohmann, William, to Whirlpool Corporation. Removable detergent dispenser for automatic washer. 3,921,421, Cl. 68-17.00R.

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Kuno, Masanori; and Kato, Tadaaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Yarn transfer method in an automatic take-up motion. 3,921,923, Cl. 242-18.00A.

Kunzel, Reiner, to Zentra Albert Burkle Kommanditgesellschaft. Drive arrangement for switching clocks. 3,922,588, Cl. 318-139.000.

Kupfrian, Wilbur J., to Robintech Incorporated. Pipe bending mandrel. 3,922,134, Cl. 425-292.000.

Kupka, Dieter. Stirrer and cover for stirring corrosive charges. 3,922,146, Cl. 23-252.00A.

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Kuske, Edward A.; and Przybylski, Darius K., to CPC International Inc. Process for converting granular starch to dextrose. 3,922,198, Cl. 195-31.00R.

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Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kohagura, Masahiro; and Takahashi, Itaru, 3,922,343.

L. R. Nelson Corporation: *See*—
Hayes, Jerry R.; and Bruninga, Kenneth J., 3,921,910.
Hayes, Jerry R., 3,921,912.

L. Schuler GmbH: *See*—
Rasenberger, Otto, 3,921,484.

La Detection Electronique Francaise Protecbat: *See*—
Lecuyer, Daniel, 3,922,655.

LaBarber, Joseph A., to Nebraska Technical Equipment Company. Method for eviscerating poultry and the like. 3,921,255, Cl. 17-11.000.

Lambert, Charles F., Jr., to Clayton & Lambert Manufacturing Co. Horizontal rotary sweeps for feed storage tanks. 3,921,829, Cl. 214-17.0CB.

Lambert, Michel: *See*—
Brichard, Edgard; and Lambert, Michel, 3,921,359.

Lamberti, Vincent; and Willis, Chester R., to Lever Brothers Company. Oligomeric polyacrylates as builders in detergent compositions. 3,922,230, Cl. 252-89.000.

Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,922,271, Cl. 260-247.10E.

Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,922,272, Cl. 260-247.10E.

Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Cooling system for the cooling of the housing of a rotary piston internal combustion engine. 3,921,593, Cl. 123-8.010.

Lampard, Robert Douglas. Internal combustion engines. 3,921,594, Cl. 123-8.050.

Lamy, Jacques Edouard, to C. G. Doris (Compagnie Generale pour les Developments Operationnels des Richesses). Anti-heave protective system. 3,921,408, Cl. 61-3.000.

Lancaster Colony Corporation: *See*—
Lea, Harlan L., 3,922,003.

Lane, Charlie W. Batting practice device. 3,921,976, Cl. 273-26.00R.

Langan, Leon V., Jr.: *See*—
Newcomb, Gilbert S., Jr.; and Langan, Leon V., Jr., 3,921,456.

Langecker, Erhard. Injection molding nozzle. 3,921,856, Cl. 222-132.000.

Lanza, Conrad, to International Business Machines Corporation. Method and means for increasing the operating range of gas panel displays. 3,922,583, Cl. 315-169.0TV.

Larroche, Jean-Baptiste. Storing mechanism for tobacco-gathering machine. 3,921,824, Cl. 214-5.500.

Larry, John Robert, to Du Pont de Nemours, E. I., and Company. Metallizations comprising nickel oxide. 3,922,387, Cl. 427-96.000.

Laszlo, Havas: *See*—
Roger, Dormenval; Laszlo, Havas; and Pierre, Mangin, 3,922,322.

Lauchenauer, Alfred E., to Raduner and Co., AG. Heat-sealable interlining for textile fabrics. 3,922,418, Cl. 428-196.000.

Lauer, Josef; and Thomas, Alfred William, to Deutsche Bendix Ausrustungs GmbH. Power boost mechanism. 3,921,502, Cl. 91-391.00R.

Laura & Vereeniging N.V.: *See*—
Blok, Simon, 3,921,951.

Laurent, Michel Armand; and Barbieux, Daniel Claude, to International Harvester Company. Comb device for cleaning grain before it passes into the cleaning-shoe of a combine-harvester. 3,921,643, Cl. 130-24.000.

Lauterbach, William L., to United States Steel Corporation. Flexible seal for briquette machine. 3,922,132, Cl. 425-237.000.

Layton, Howard M. Differential hydrometer assembly. 3,921,461, Cl. 73-447.000.

Lazarus, Harry J. Retainerless dental matrix and method of manufacture. 3,921,299, Cl. 32-63.000.

Lea, Harlan L., to Lancaster Colony Corporation. Spray shield for the wheels of a highway vehicle. 3,922,003, Cl. 280-154.50R.

Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, to CPC International Inc. Enzymatic hydrolysis of granular starch. 3,922,196, Cl. 195-31.00R.

Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, to CPC International Inc. Process for converting granular starch to dextrose. 3,922,197, Cl. 195-31.00R.

Leach, Harry Woods: *See*—
Hebeda, Ronald Emil; Holik, Dennis John; and Leach, Harry Woods, 3,922,199.
Hebeda, Ronald Emil; and Leach, Harry Woods, 3,922,201.

Lear Siegler, Inc.: *See*—
Masser, Lloyd D., 3,921,999.

Lebzelter, Joseph, to United States of America, Army. Limit valve with overtravel detector. 3,921,665, Cl. 137-553.000.

Lechnir, Richard J.: *See*—
Schroeder, Collin H.; Lechnir, Richard J.; and Derse, Philip H., 3,922,291.

LeCocq, Andrew D.: *See—*
Harding, Wayne M.; Williams, Neal M.; and LeCocq, Andrew D., 3,921,385.

Lecuyer, Daniel, to La Detection Electronique Francaise Protecbat. Smoke or fire detector. 3,922,655, Cl. 340-237.00S.

Ledley, Robert S. Diagnostic X-ray systems. 3,922,552, Cl. 250-369.000.

Ledwell, Lloy W., Jr. Method and apparatus for harvesting domestic fowl. 3,921,588, Cl. 119-82.000.

Lee, Jeh-Mann; and Roos, Charles E., to Vanderbilt University. High intensity magnetic sorter. 3,922,219, Cl. 209-223.00A.

Lee, Jin G. Wavelength calibrator for clinical instruments. 3,922,095, Cl. 356-225.000.

Lee, Richard G. Carton sealing machine. 3,921,371, Cl. 53-387.000.

Lehfeldt, James J., to King Radio Corporation. Aircraft rate trim system. 3,921,941, Cl. 244-77.00F.

Lehmann, Helmut: *See—*
Jores, Willi; Lehmann, Helmut; and Hoffacker, Franz, 3,921,926.
Jores, Willi; Hoffacker, Franz; Kreit, Bernhardt; Lehmann, Helmut; and Hardenbicker, Herbert, 3,921,929.

Leiber, Heinz, to Teldix GmbH. Valve with a plurality of connections. 3,921,666, Cl. 137-557.000.

Leimgruber, Willy; and Wick, Alexander E., to Hoffmann-La Roche Inc. Process for the methylenation of catechols. 3,922,285, Cl. 260-340.500.

Leisure, Ronald K.: *See—*
Konantz, Mark L.; and Leisure, Ronald K., 3,922,385.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Byer, Robert L.; and Herbst, Richard L., 3,922,561.

Lemcke, Bo: *See—*
Glenn, Lewis A.; Lemcke, Bo; and Ryhming, Inge, 3,921,915.

Lemke, Timothy Allen; and Fusselman, David Francis, to AMP Incorporated. Carrier strip fed socket terminal. 3,922,057, Cl. 339-258.00P.

Leonard, Verna M. Keyboard chord and rhythm coordinator. 3,921,493, Cl. 84-474.000.

Leone, Anselm James, to Bunker-Ramo Corporation, The. Mechanism for tide clock. 3,921,383, Cl. 58-3.000.

Lester, William C.: *See—*
Brunner, Rolf H.; Carbone, Quiedo J.; and Lester, William C., 3,921,572.

Lesur, Ernest Jacques Andre, to Exaprecis S.A. Device for transmitting force. 3,922,603, Cl. 324-99.00R.

Letize, Raymond A.; and Johnson, James A., to MacDermid Incorporated. Specific gravity monitor. 3,922,511, Cl. 200-84.00C.

Letoffe, Michel: *See—*
Ceyzeriat, Louis; and Letoffe, Michel, 3,922,246.

Lettini, Michael J.; and Stock, Howard P., to Boeing Company, The. Blind, shank expanding electrical terminal structure. 3,922,050, Cl. 339-14.00R.

Leupold, Ernst Ingo; and Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the manufacture of isopropyl esters by the reaction of propylene with carboxylic acids. 3,922,294, Cl. 260-410.90R.

Levasseur, Dornis, to Allied Chemical Corporation. Vehicle sensitive retractor with gap in ball sensing unit. 3,921,931, Cl. 242-107.400.

Lever Brothers Company: *See—*
Lamberti, Vincent; and Willis, Chester R., 3,922,230.
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Lamberti, Vincent, 3,922,272.
Ney, Karl Heinz; Wirotana, I. Poetoe Gde; and Freytag, Wolfram Gustav, 3,922,365.
Sneath, Michael Edwin, 3,922,360.

Lewandowski, Raymond, to Etudes et Procedes d'Assainissement Purator EPAP, Societe Anonyme. Apparatus for treating waste waters. 3,922,224, Cl. 210-223.000.

Lewis, Bernard L., to United States of America, Navy. Polarization rotation technique for use with two dimensional TEM mode lenses. 3,922,681, Cl. 343-754.000.

Lewis, Donald J., to Allied Chemical Corporation. Inflation time control for safety device. 3,922,001, Cl. 280-150.0AB.

Lewis, Harry T., Jr.; and Getsinger, John G., to Tennessee Valley Authority. Production of nitrogen-phosphorus compounds. 3,922,157, Cl. 71-34.000.

Lewis, Paul E., to A. B. Chance Company. Open configuration midspan electrical conductor spacer. 3,922,481, Cl. 174-146.000.

Lewus, Alexander J. Auxiliary power system for automotive vehicle. 3,921,746, Cl. 180-53.00R.

Leybold-Heraeus-Verwaltung G.m.b.H.: *See—*
Grof, Helmut Theodor; Sonntag, Heinrich Fritz; Scheidig, Helmut; and Wamser, Anton, 3,921,698.

Lichtenberg, Alfred, to Siemens Aktiengesellschaft. Electrodynamic suspension arrangement. 3,921,535, Cl. 104-148.0SS.

Lighthall, John T.; and Shaver, David M., to GTE Automatic Electric (Canada) Limited. Ring core memory arrangement. 3,922,653, Cl. 340-174.0DA.

Limpens, Karl: *See—*
Glindmeyer, Friedrich; Hennenberg, Wilhelm Friedrich; and Limpens, Karl, 3,921,679.

Lindaco Ltd.: *See—*
Astero, Jan-Erik, 3,922,079.

Lindbert, Brook A.; Mertz, Edward H.; and McCollum, Wesley L., to General Motors Corporation. Occupant restraint system. 3,922,002, Cl. 280-150.0AB.

Lindblom, Karl-Peter Christian: *See—*
Danielsson, Nils Allan; and Lindblom, Karl-Peter Christian, 3,922,089.

Linde Aktiengesellschaft: *See—*
Meinass, Helmut, 3,921,917.

Linden-Alimak AB: *See—*
Westerlund, Tage, 3,921,763.

Linden, Henry R.; Tarman, Paul B.; and Feldkirchner, Harlan L., to American Gas Association. Process for production of hydrocarbon liquids and gases from oil shale. 3,922,215, Cl. 208-11.000.

Lindgren, John Ivar; Udden, Per Edward Carl; and Wennerblow, Bengt Axel. Method of producing a temporarily product and products produced according to said method. 3,922,434, Cl. 428-342.000.

Lindgren, Stig: *See—*
Svensson, Stig; and Lindgren, Stig, 3,922,028.

Lindsay Manufacturing Company: *See—*
Zimmerer, Arthur L., 3,921,908.

Lingens, Paul: *See—*
Christmann, Wolfgang; Klunsch, Maximilian; and Lingens, Paul, 3,921,497.

Links, Heinz, to Robert Bosch G.m.b.H. Fuel injection apparatus for internal combustion engines. 3,921,604, Cl. 123-139.00E.

Liogonkaya, Rakhil Izrailevna: *See—*
Danjushevsky, Solomon Isaakovich; Liogonkaya, Rakhil Izrailevna; and Sudakas, Lev Girshovich, 3,921,717.

Lipe, Bruce R.: *See—*
Erickson, Reinhold Barry; and Lipe, Bruce R., 3,921,902.

Lipinski, Christopher A.; Stam, John G.; DeAngelis, Gerald G.; and Hess, Hans-Jurgen E., to Pfizer Inc. Pyrimidinones and hydroxy pyrimidines. 3,922,345, Cl. 424-251.000.

Liquid Processing AB: *See—*
Feres, Vaclav, 3,921,709.

Liu, Chia-Seng: *See—*
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 3,922,329.

Livesay, William R., to Radiant Energy Systems, Inc. Electron beam pattern generator. 3,922,546, Cl. 250-310.000.

Loc-Coe: *See—*
Coe, Donald K., 3,921,494.

Locati, Giuseppe. Split-structure skis. 3,921,994, Cl. 280-11.13W.

Locke, Frederic J.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 3,922,447.

Locke, John Michael; and Viney, Martin, to International Synthetic Rubber Co., Ltd., The. Polymer treatment process. 3,922,256, Cl. 260-80.780.

Loctite (Ireland), Limited: *See—*
Bolger, Bernard J., 3,922,449.

Logan, Arthur D.; and Rush, James B., to Dayco Corporation. Hose construction and method of making same. 3,921,674, Cl. 138-130.000.

Logan, Forrest E., to Occidental Petroleum Corporation. Isokinetic sampling probe. 3,921,458, Cl. 73-422.00R.

Long, J. C. Pegboard container holder. 3,921,948, Cl. 248-223.000.

Looby, James J.; and Looby, Michael J. Fishing rod holder. 3,921,329, Cl. 43-21.200.

Looby, Michael J.: *See—*
Looby, James J.; and Looby, Michael J., 3,921,329.

Loop-A-Line, Inc.: *See—*
McGahee, Welbourne D., 3,921,589.

Loos, Kurt; and Moritz, Werner, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Drag chain. 3,921,388, Cl. 59-78.100.

Lorain Products Corporation: *See—*
Brown, Harold J., 3,922,594.

Lord, Jeffrey D.: *See—*
Stephens, Dwight L.; and Lord, Jeffrey D., 3,922,244.

Love, Fred E., to Tenneco Chemicals, Inc. Impact-resistant vinyl halide resin compositions containing a styrene-butadiene-alkyl methacrylate polymer and a styrene-acrylonitrile copolymer. 3,922,320, Cl. 260-876.00R.

Lowe, Gordon Campbell: *See—*
Cooper, Gordon Arthur; Goddard, Kenneth Douglas; and Lowe, Gordon Campbell, 3,922,494.

Lowen, Michael David; and Newby, Ronald, to John Laing & Son Limited. Motion detecting apparatus. 3,921,434, Cl. 73-37.000.

Lowrey, Orvey Preston, Jr.; Hammond, Frank Walter; and Slack, Raymond Bender, to United Technologies Corporation. Method for plating articles with particles in a metal matrix. 3,922,207, Cl. 204-16.000.

Lowrey, R. Dean: *See—*
Wegwerth, Arthur A.; and Lowrey, R. Dean, 3,922,440.

Lozier, Gerald Scott, to RCA Corporation. Method for coating ferrous-metal mask for cathode-ray tube. 3,922,394, Cl. 427-247.000.

LTV Aerospace Corporation: *See—*
Allsup, Harvey C., Jr., 3,921,466.
Nelson, Roy A., 3,921,532.

Lubbers, Dietrich W.; and Wodick, Reinhard, to Max Planck Gesellschaft. Method and apparatus for photometric measurement of concentration ratios. 3,922,088, Cl. 356-40.000.

Luberoff, Benjamin J.: *See—*
Sze, Morgan C.; and Luberoff, Benjamin J., 3,922,147.

Lubke, Roger A.; and Varecka, Charles P., to Honeywell Inc. Seismic human footstep detector. 3,922,663, Cl. 340-261.000.

Lucas Aerospace Limited: *See—*
Carr, Eric; and McClave, Kenneth, 3,921,392.

Lucas Electrical Company Limited, The: *See—*
Hollyoak, John David, 3,922,558.

Ludloff, Karl. Method of measuring torque. 3,921,446, Cl. 73-136.00R.

Lummus Company, The: *See—*
Sze, Morgan C.; and Luberoff, Benjamin J., 3,922,147.

Lumsden, James Ray. Remote meter reading transponder. 3,922,492, Cl. 179-2.00A.

Lundberg, Robert Dean: *See—*
Koleske, Joseph Victor; Whitworth, Clyde Jesse, Jr.; and Lundberg, Robert Dean, 3,922,239.

Lunkenheimer Company, The: *See—*
Haddad, Joseph J., Jr., 3,921,955.

Lunquist, Richard Eli, to Motorola, Inc. Lock detector for a phase locked loop. 3,922,602, Cl. 324-83.00Q.

Lunsford, John Albert, to RCA Corporation. Approximator for square root of sums of squares. 3,922,540, Cl. 235-193.500.

Lyaskovskaya, Julia Nazarovna: *See—*
Gorbatov, Vasily Matveevich; Sinitsin, Konstantin Dmitrievich; Krylova, Nina Nikolaevna; Lyaskovskaya, Julia Nazarovna; Volovinskaya, Valentina Pavlovna; Bazarova, Klavdia Ivanovna; Solovieva, Ljudmila Ivanovna; and Khlamova, Rimma Igorevna, 3,922,367.

Lynch, Francis Bernard, to Curran Oils Limited. Vitreous enamelling. 3,922,458, Cl. 428-210.000.

Lynes, Inc.: *See—*
Malone, Billy C.; and Halbardier, Floyd A., 3,921,427.

M & T Chemicals Inc.: *See—*
Passal, Frank, 3,922,209.
Woehrle, Richard E., 3,922,183.

Mabuchi, Kenichi, to Mabuchi Motor Co. Ltd. Gear assembly. 3,921,470, Cl. 74-414.000.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi, 3,921,470.

MacDermid Incorporated: *See—*
Letize, Raymond A.; and Johnson, James A., 3,922,511.

MacDonald, David J.; and Eisele, Judith A., to United States of America, Interior. Preparation of microporous rare-earth oxyhalides. 3,922,331, Cl. 423-263.000.

Macdonald, Warren E. Flush valve regulator. 3,921,226, Cl. 4-56.000.

MacDuff, Richard: *See—*
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 3,922,329.

Macher, Karl, to Jos. Schneider & Co. Optische Werke. High-speed varifocal objective. 3,922,070, Cl. 350-184.000.

Macie, Henry J. Bottom dump container for bulk material. 3,921,892, Cl. 229-17.00B.

MacLean-Fogg Lock Nut Co.: *See—*
Oaks, Daniel V., 3,921,276.

Macronetics, Inc.: *See—*
Roberson, Glenn A., Jr.; Beaver, Robert I., II; and Kelly, Edward L., 3,921,788.

Maddock, Robert John: *See—*
Beynon, John David Emrys; Newell, Alan Francis; Maddock, Robert John; and Stevenson, Robert Andrew, 3,922,646.

Mader, Helmut: *See—*
Hupp, Gerhard; and Mader, Helmut, 3,921,326.

Madonian, Vahe S.; and Keskine, Peter I. O., to International Telephone and Telegraph Corporation. Electrically operated rotational actuator with failsafe disengagement. 3,921,264, Cl. 74-785.000.

Madrange, Annie: *See—*
Abegg, Jean-Louis; and Madrange, Annie, 3,922,341.

Madsen, Eigil. Overhead or gantry crane with a yoke. 3,921,816, Cl. 212-27.000.

Maeda, Riichi. Centrifugal blasting apparatus. 3,921,337, Cl. 51-9.00R.

Maehara, Toshinori; Kimura, Yoshinobu; Takeuchi, Hirotoku; and Takegami, Masao, to Aida Engineering Kabushiki Kaisha; and Zaidan Hojin Kikai Shinko Kyokai. Process for continuously processing a web or strip material in a press. 3,921,887, Cl. 228-155.000.

Magnetic Controls Company: *See—*
Brady, Brian B., 3,922,508.

Mahide, Buhei; and Onai, Atushi, to Kohkoku Chemical Industry Co., Ltd. Injection molded boots. 3,921,313, Cl. 36-4.000.

Mailer, Werner H.: *See—*
Gentzlinger, Richard V.; and Mailer, Werner H., 3,921,780.

Mairet, Andre: *See—*
Benoit, Robert; and Mairet, Andre, 3,921,744.

Makuch, John Andrew, to Combustion Engineering, Inc. Implosion door operating mechanism. 3,921,546, Cl. 110-173.00B.

Malfese, William F.: *See—*
Athas, Gregory R.; Draayer, Johannes; Malfese, William F.; Reynolds, Nigel J. E.; and Potenza, George W., 3,922,499.

Malone, Billy C.; and Halbardier, Floyd A., to Lynes, Inc. Inflatable device. 3,921,427, Cl. 72-59.000.

Malsby, Marc W.: *See—*
Clark, Kenneth M.; and Malsby, Marc W., 3,922,064.

Manasevit, Harold M., to Rockwell International Corporation. Process for producing nitride films. 3,922,475, Cl. 428-539.000.

Manco Mfg. Co.: *See—*
Valente, Raymond L., 3,921,486.

Maneely-Illinois, Inc.: *See—*
Rossi, Joseph R.; Griffiths, Frederick J.; Griffin, James L.; and Palleson, Gormen C., 3,921,964.

Mann, Stuart N., to Hurley, John F. Pediatric crib. 3,921,233, Cl. 5-97.000.

Manns, Basil H.: *See—*
Burkhardt, Lawrence E.; and Manns, Basil H., 3,921,530.

Manschot, James G.: *See—*
Mather, Byron L.; and Manschot, James G., 3,921,634.

Manz, Ulrich: *See—*
Klaui, Heinrich; Manz, Ulrich; Rigassi, Norbert; Ryser, Gottlieb; and Schwieter, Ulrich, 3,922,368.

Maoz, Eliahou, to Setec Societe d'estudes Techniques Anstalt. Rotary machine. 3,921,601, Cl. 123-44.00E.

Mapes, Carl R.: *See—*
Sauer, Gale E.; and Mapes, Carl R., 3,921,346.

Maples, Jerome K.: *See—*
McCullough, Charles M.; and Maples, Jerome K., 3,922,120.

Marchetti, Joseph R.: *See—*
Jerabek, Robert D.; and Marchetti, Joseph R., 3,922,253.

Marcona Corporation: *See—*
Miscovich, John A., 3,922,112.

Marcus, Joel. Web severing device. 3,921,481, Cl. 83-117.

Marek, Jiri Frantisek; Evans, Bruce Ronald; and Callcott, Thomas George, to Broken Hill Proprietary Company Limited, The. Fluidized bed apparatus and methods. 3,921,307, Cl. 34-10.000.

Marek, Ronald W.; and Yudichak, William T., to Airco, Inc. Foam carbonization and resulting foam structures. 3,922,334, Cl. 423-445.000.

Marforio, Nerino, to Virginio Rimoldi & C. S.p.A. Guide and sewing device for fabric layers along a shaped edge. 3,921,550, Cl. 112-121.120.

Marine Colloids, Inc.: *See—*
Renn, Donald W., 3,922,432.

Markey, Robert Harvey, to Multifastener Corporation. Laminated nut and clip. 3,921,686, Cl. 151-21.00C.

Marona, Robert N.: *See—*
Noyes, Androus D.; and Marona, Robert N., 3,921,897.

Marotta Scientific Controls, Inc.: *See—*
Kowalski, Slawomir, 3,921,660.

Marquette Metal Products Co.: *See—*
Szabo, Andrew Thomas, 3,921,771.

Marr, Fritz; and Dauernheim, Hans, to H.T. Golde GmbH. Device for fastening cable guide tubes in motor vehicles. 3,922,102, Cl. 403-346.000.

Marrone, Frederick A., to United States of America, Navy. Winch mounted optical data transmission cable with fluid coupling. 3,922,063, Cl. 350-96.00C.

Martin, Henry; Rufener, Jacques; and Pissiotas, Georg, to Ciba-Geigy AG. Method for inhibiting the growth of dicotyledonous plants. 3,922,158, Cl. 71-76.000.

Martin, James H., Jr., to Du Pont de Nemours, E. I., and Company. Spiral plate yarn measuring capacitance cell. 3,922,601, Cl. 324-61.00R.

Martin, John, to Fabricacion de Maquinas, S.A. Glazing apparatus. 3,922,156, Cl. 65-272.000.

Martin, Timothy W.: *See—*
Caletti, Robert H.; Martin, Timothy W.; and Swain, Ronald L., 3,922,720.

Martino, Germain; Stern, Robert; and Cosyns, Jean, to Institut Francais du Petrole. Process for purifying butadiene and isoprene by selective hydrogenation of the acetylenic impurities contained therein. 3,922,318, Cl. 260-681.50R.

Maruyama, Eiichi: *See—*
Goto, Naohiro; Izozaki, Yukinao; Shidara, Keiichi; Maruyama, Eiichi; Hirai, Tadaaki; Inao, Kiyohisa; and Mori, Ikue, 3,922,579.

Maruyama, Isamu: *See—*
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,922,264.

Marvin Glass & Associates: *See—*
Terzian, Rouben T.; Glass, Marvin I., deceased; and Sonderling, Ernest, executor, 3,921,332.

Masaoka, Takashi; Watanabe, Noritoshi; Takegawa, Yasuo; and Kitahori, Tojiro, to Kanzaki Paper Mfg. Co. Ltd. Paper material for pressure sensitive recording system. 3,922,463, Cl. 428-323.000.

Maschinenfabrik Goebel GmbH: *See—*
Thomas, Hermann; Kreiter, Heinz; and Weber, Friedrich, 3,921,968.

Maschinenfabrik u. Giessuei Netstal AG: *See—*
Neff, Engelbert; and Fehr, Jakob, 3,921,963.

Masnik, Walter; and Bloom, Gerald, to Flo-Tron, Inc. Mass flowmeter. 3,921,448, Cl. 73-205.00D.

Mason, Lloyd R., to Tu-N-One PWR. Internal combustion and steam powered engine. 3,921,404, Cl. 60-618.000.

Massachusetts Institute of Technology: *See—*
Javan, Ali, 3,922,618.
Wolff, Peter A., 3,922,560.

Masser, Lloyd D., to Lear Siegler, Inc. Vehicle suspension construction and sub-assembly therefor. 3,921,999, Cl. 280-104.50R.

Massey-Ferguson Services N.V.: *See—*
Etwell, Cecil C., 3,921,547.

Mastriani, Elvin A.; and Mastriani, Robert E., to Arrow Converting Equipment, Inc. Compact slitting mechanism. 3,921,488, Cl. 83-505.000.

Mastriani, Robert E.: *See—*
Mastriani, Elvin A.; and Mastriani, Robert E., 3,921,488.

Mastropole, Alfred J.: *See*—
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Mathauser, William R. Self-energizing bicycle brake. 3,921,764, Cl. 188-24.000.
Mather, Byron L.; and Manschot, James G., to Plastronics, Inc. Valve and outlet tube combination for a plastic bag. 3,921,634, Cl. 128-227.000.
Matsubara, Midori: *See*—
Umezawa, Hamao; Nakayama, Yuya; Kunishima, Mamoru; and Matsubara, Midori, 3,922,262.
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Matsui, Hiroshi: *See*—
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Matsui, Toru, to Minolta Camera Kabushiki Kaisha. Camera automatic exposure control mechanism. 3,922,693, Cl. 354-42.000.
Matsumoto, Kunio, to Copal Company Limited. Electronic shutter for photographic camera. 3,922,691, Cl. 354-51.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hirashima, Masayoshi, 3,922,715.
Sasabe, Kaoru; Okino, Yoshihiro; and Hayami, Heijiro, 3,922,711.
Shimahara, Yoichi; Shimada, Takashi; Kitamura, Shigeki; Miyanishi, Hiroshi; and Senda, Hiroshi, 3,922,639.
Matsushita Electronics Corporation: *See*—
Koike, Susumu, 3,922,710.
Matsuura, Hideji. Drive system for cycle. 3,921,467, Cl. 74-219.000.
Matsuyama, Junichi; Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Ohi, Reiichi; and Kondo, Tokiharu, deceased (by Kondo, Yoshiharu, legal representative). Silver halide photographic emulsions used for electron beam recording. 3,922,556, Cl. 250-475.000.
Matuzawa, Takeo: *See*—
Nishio, Yasuhiro; Yonekubo, Hirosi; Matuzawa, Takeo; Hanamura, Tosiki; and Ishibayashi, Kunimoto, 3,921,336.
Matyschik, Otto, to SKF Industrial Trading and Development Co. Self centering clutch release bearing. 3,921,775, Cl. 192-98.000.
Maul, Johann; Schulz, Friedrich; and Wittmaack, Klaus, to Gesellschaft fur Strahlen-und Umweltforschung mbH, Munich. Device for separation of sputtered neutrals and high energy ions from sputtered low energy ions. 3,922,544, Cl. 250-296.000.
Maurer, Herman J.: *See*—
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May & Egger, Inc.: *See*—
May, John, 3,921,766.
May, John, to May & Egger, Inc. Trailer brake. 3,921,766, Cl. 188-167.000.
May, Oswald; and Gego, Arno, to Klockner-Humbolt-Deutz Aktiengesellschaft. Vehicle, especially motor vehicle for agricultural purposes. 3,921,742, Cl. 180-50.000.
Mayer, Edward A.: *See*—
McGahey, Dean C.; Vest, Eugene W.; and Mayer, Edward A., 3,921,682.
Mayer, Edward F.: *See*—
Genthe, James E.; and Mayer, Edward F., 3,921,578.
Mayer, Hans; and Schroder, Heinz-Jurgen, to Siemens Aktiengesellschaft. Pressurized-water coolant nuclear reactor steam generator. 3,921,591, Cl. 122-34.000.
Mayer, Simon Ernest, to Kuhns, Roberta B. Data bearing card having an aesthetic, magnetizable, colorless, transparent coating thereon. 3,922,430, Cl. 428-325.000.
Mayers, Bernard J.: *See*—
Evers, William J.; Heinsohn, Howard R., Jr.; and Mayers, Bernard J., 3,922,288.
Mazdiyasni, Khodabakhsh S.; and Brown, Leanne M., to United States of America, Air Force. Process for preparing mullite powder and fabrication of structural bodies therefrom. 3,922,333, Cl. 423-327.000.
McClave, Kenneth: *See*—
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McCollum, Robert W., to Otis Engineering Corporation. Well drilling and precompletion method. 3,921,719, Cl. 166-315.000.
McCollum, Wesley L.: *See*—
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McCombs, Frank P.: *See*—
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McCulloch, Robert P.; and Smith, Stephen Hagar, 3,921,745.
McCulloch, Robert P.; and Smith, Stephen Hagar, to McCulloch Corporation. Electric bicycle. 3,921,745, Cl. 180-33.00C.
McCullough, Charles M.; and Maples, Jerome K. Rotary engines. 3,922,120, Cl. 418-5.000.
McCullough, Thomas W., to United States of America, Navy. Tension link control device. 3,922,104, Cl. 403-2.000.
McDonald, William V. Corrugating system employing controllable steam shower. 3,922,129, Cl. 425-135.000.
McDonnell Douglas Corporation: *See*—
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McDonough, Thomas L.; and McDonough, Martin M., to Calx, Inc. Beam lead tool. 3,921,884, Cl. 228-44.100.
McElhoe, Bruce A.; and Tabrah, Joseph G., to Hawaiian Sugar Planters' Association. Soil irrigation methods and apparatus. 3,921,905, Cl. 239-110.000.
McFearin, Thurman Chestler, Jr., to El Paso Products Company. Novel process for the preparation of cyclopentane-1, 2-diones and intermediates therefor. 3,922,296, Cl. 260-468.00K.
McGahee, Welbourne D., to Loop-A-Line, Inc. Animal tethering apparatus. 3,921,589, Cl. 119-121.000.
McGahey, Dean C.; Vest, Eugene W.; and Mayer, Edward A., to Texaco Inc. Automatic fuel dispensing nozzle. 3,921,682, Cl. 141-128.000.
McGonigal, Gerald: *See*—
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McGregor, Clifford A., to Raymond Lee Organization, Inc., The, a part interest. Electrical device. 3,922,055, Cl. 339-105.000.
McGuffin, William George; and Burgen, Robert Walter, to RCA Corporation. Circuit for producing odd frequency multiple of an input signal. 3,922,593, Cl. 321-4.000.
McInerney, Charles E.; Cholvin, Robert L.; and Egli, Hans, to Garrett Corporation, The. Auxiliary air supply system and method for turbocharged engines. 3,921,403, Cl. 60-606.000.
McKee, James Glen, to Canadian Industries Ltd. Explosive cartridge. 3,921,529, Cl. 102-24.00R.
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McLain, Charles D., to Olin Corporation. Apparatus for making welded corrugated tube. 3,921,883, Cl. 228-17.500.
McLean, James D.; and Holland, John F., to Dow Chemical Company, The. Portable polarographic analyzer and quick polarographic determinations. 3,922,205, Cl. 204-1.00T.
McNair, Robert J.: *See*—
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McPhee, Charles J., to American Hospital Supply Corporation. Thermoplastic bottle with controlled lateral collapse and method of dispensing liquid therefrom. 3,921,630, Cl. 128-214.00R.
McWilliams, Joseph E. Mobile storage and display arrangement for pictorial art. 3,921,320, Cl. 40-32.000.
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Meier, William A., to Signode Corporation. Fixed length loop-forming strap and overlap joint therefor. 3,921,799, Cl. 206-83.500.
Meinass, Helmut, to Linde Aktiengesellschaft. Method of comminuting of materials at low temperatures. 3,921,917, Cl. 241-17.000.
Meisenheimer, Daniel T., Jr.; Meisenheimer, Daniel T., III; and Meisenheimer, Richard C., to Spectrum Associates, Inc. Self-closing breakaway valve assemblies. 3,921,656, Cl. 137-68.000.
Meisenheimer, Daniel T., Jr. Temperature compensated pressure differential sensing device with switch actuated by pressure capsule. 3,922,515, Cl. 200-83.00S.
Meisenheimer, Daniel T., III: *See*—
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Mendelsohn, Jack. Parking compensator. 3,922,638, Cl. 340-51.000.
Menigat, Richard; and Fennemann, Wolfgang, to Metallgesellschaft Aktiengesellschaft. Method of incinerating salt-containing liquid sludge. 3,921,543, Cl. 110-7.00B.
Merck & Co., Inc.: *See*—
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Merson, Karol J. Ventilated prefabricated metal storage building. 3,921,508, Cl. 98-33.000.

Mertz, Edward H.: *See—*
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Metering Pumps Limited: *See—*
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Mettoy Company Limited, The: *See—*
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Meyer, Lawrence F. Modular structure. 3,922,045, Cl. 312-108.000.

Mezhuev, Alexandr Tikhonovich: *See—*
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Miciukiewicz, Joseph F., to Pitney-Bowes, Inc. Sheet orienting apparatus. 3,921,974, Cl. 271-240.000.

Micromedic Systems, Inc.: *See—*
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Middleman, Stanley; and Devellian, Richard D., to Kenics Corporation. Permeable membrane separation device and method. 3,922,220, Cl. 210-23.000.

Migeon, Rene, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Doubled parallel electric power sources. 3,922,559, Cl. 307-64.000.

Mikada, Hiroyuki: *See—*
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Mikitenko, Paul: *See—*
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Milbrath, Mary Guenther. Dental care kit. 3,921,649, Cl. 132-84.00D.

Miller, Arthur F.; and Schmiedel, Robert C., to Brunswick Corporation. Instrumentation presentation. 3,921,569, Cl. 116-129.00P.

Miller, Laurence G., to Rank Xerox Ltd. Sheet stack receptacle. 3,921,972, Cl. 271-171.000.

Miller, Stephen H.: *See—*
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Mills, Kenneth R., to Phillips Petroleum Company. Stabilized antistatic compositions useful with olefin polymers. 3,922,249, Cl. 260-45.80R.

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Misak, Marvin D., to Halliburton Company. Temperature-stable aqueous gels. 3,922,173, Cl. 106-194.000.

Miscovich, John A., to Marcona Corporation. Eductor jet pump and method. 3,922,112, Cl. 417-54.000.

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Mitchell, Douglas Allison; and Pearce, Arnold. Fluidised bed incinerators. 3,921,590, Cl. 122-4.00D.

Mitchell, Maurice M., Jr.; and Tomezsko, Edward S. J., to Atlantic Richfield Company. Process for the preparation of nitroaromatic compounds. 3,922,315, Cl. 260-645.000.

Mitchell, Robert W.: *See—*
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Mitsui Mining & Smelting Co., Ltd.: *See—*
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Miwa, Hideyuki, to Otsuka Pharmaceutical Company Limited. Pharmaceutical compositions for treating lung diseases. 3,922,340, Cl. 424-45.000.

Miyagawa, Tomoyuki: *See—*
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Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, to Japan Steel Works Ltd. Method for a build-up welding of different metals. 3,922,519, Cl. 219-76.000.

Miyata, Shohiko: *See—*
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Mizuno, Yasushi: *See—*
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Mizutani, Tadashi; and Tachibana, Hiromichi, to Kuraray Plastics Co., Ltd. Transfer device for helically wound tubes. 3,921,841, Cl. 214-339.000.

Mizzi, Laurence. Tilt correcting device for a sugar cane harvester. 3,921,374, Cl. 56-208.000.

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Monett, Edward, to Roller Corporation of America. Molding apparatus for making an intrauterine device. 3,921,954, Cl. 249-88.000.

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Montgomery, W. T. S., Jr. Diverter valves. 3,922,019, Cl. 302-28.000.

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Moog, William C.; and Mastropole, Alfred J., to Moog Inc. Ski binding. 3,921,995, Cl. 280-11.35K.

Moore, Curtis E.: *See—*
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Moore, Robert A.; and Sullivan, Daniel J., to Itek Corporation. Multiple development method and apparatus for electrophotographic copiers. 3,921,571, Cl. 118-7.000.
Moore, Robert A., to Itek Corporation. Heating apparatus for electrophotographic copiers. 3,922,520, Cl. 219-216.000.
Moreau, Rene V., to Societe Anonyme: Poclain. Earth moving machine bucket with pivotable sides. 3,921,316, Cl. 37-118.00A.
Morehead, Jean: *See*—
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Morozowich, Walter, to Upjohn Company, The. Prostaglandin F-type 9-monoacylates. 3,922,293, Cl. 260-410.000.
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Morrow, Warren P., to United States of America, Army. Double element setback lock. 3,921,531, Cl. 102-78.000.
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Motta, Salvatore; Rosen, Bernard Walter; and Vasilos, Thomas, to Avco Corporation. Honeycomb reinforced material and method of making the same. 3,922,411, Cl. 428-116.000.
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Moyer, Norman E., to Hughes Aircraft Company. Digital watch having dual purpose ring counter. 3,921,384, Cl. 58-23.00R.
Mracek, Milo F.; and Bauer, Ronald J., to Mracek, Milo F. Portable support for a bed patient. 3,921,234, Cl. 4-112.000.
MTS Systems Corporation: *See*—
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Hauffe, William L.; and Saha, Narayan C., 3,921,449.
Hauffe, William L.; and Saha, Narayan C., 3,921,662.
Muller, Hans Max, to Eastman Kodak Company. Photographic camera for use with different types of photographic flash devices. 3,922,695, Cl. 354-141.000.
Muller, Reinhard: *See*—
Willmann, Erich; and Muller, Reinhard, 3,922,531.
Muller, Stefan: *See*—
Effenberger, Rudolf; Muller, Stefan; and Reinhardt, Heinz, 3,921,248.
Muller, Werner H., to Hoechst Aktiengesellschaft. Process for preparing cyclohexanediones-(1,3). 3,922,307, Cl. 260-586.00C.
Multifastener Corporation: *See*—
Markey, Robert Harvey, 3,921,686.
Mumford, Eustace H.; and Rieck, Albert W., to Owens-Illinois, Inc. Adjustable stroke invert drive motor for a glass forming machine. 3,921,504, Cl. 92-13.400.
Munro, James M.; Pimental, David J.; Ramstad, David J.; and Hinves, John R., to United States of America, Navy. Diverless helicopter weapon recovery devices. 3,921,943, Cl. 244-137.00R.
Munzel, Howard E.: *See*—
Kukla, William J.; and Munzel, Howard E., 3,922,382.
Murachi, Mikio: *See*—
Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, 3,921,273.
Murao, Kenji; Toriyama, Kazuhisa; Kamezawa, Norimasa; and Kitamura, Teruo, to Hitachi, Ltd. Electro-optical display device including an improved liquid crystal composition. 3,922,067, Cl. 350-160.0LC.
Murata, Toshifumi: *See*—
Yusa, Hideo; Kamiya, Kunio; Murata, Toshifumi; Yamaki, Hideo; and Hisatomi, Shigenobu, 3,922,150.
Murawski, Kurt; Hagen, Rolf; Heitzig, Claus-Peter; and Weiss, Jurgen, to Siemens Aktiengesellschaft. Mounting arrangement for interference suppression and shielding a multiplicity of electrical lines. 3,922,056, Cl. 339-143.00R.
Murnane, Raymond J.; and Bolton, Theodore S., to Carrier Corporation. Spring bias for damper door of an air conditioning unit. 3,921,416, Cl. 62-427.000.
Murphree, Francis J., to United States of America, Navy. Automatic vehicle positioning system. 3,922,630, Cl. 340-3.00R.
Murphree, Francis J., to United States of America, Navy. Automatic vehicle positioning system. 3,922,632, Cl. 340-3.00R.
Murphy, Charles F.; and Webber, J. Alan, to Eli Lilly and Company. 3-Halomethyl-Δ^3-Cephalosporin esters. 3,922,268, Cl. 260-243.00C.
Murphyores Incorporated Pty., Ltd.: *See*—
Reid, Allen Forrest; and Sinha, Hari Narayan, 3,922,164.
Murray, Harry Aloysious. Portable burglar alarm. 3,921,564, Cl. 116-82.000.
Murray, Thomas E.: *See*—
Galluzzi, John F.; Saldarini, Albert V.; and Murray, Thomas E., 3,922,354.
Murrell, Lawrence L.: *See*—
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Nabetani, Hiroshi; Ueda, Atsushi; Uota, Kosaku; and Ishii, Mitsuaki, to Mitsubishi Denki Kabushiki Kaisha. Potential detector. 3,922,569, Cl. 307-235.00R.
Nachet, Philippe, to Societe d'Optique, Precision Electronique et Mecanique - Sopelem. Optical apparatus for the microscopic examination of the internal walls of an opening. 3,922,097, Cl. 356-241.000.
Nagase, Hiroshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Circuit for detecting a physical quantity. 3,922,597, Cl. 323-75.00B.
Nagashima, Yoshihisa: *See*—
Torii, Tatsuki; Nagashima, Yoshihisa; Kitamura, Haruhiko; and Mori, Etsuo, 3,922,233.
Nagy, Kornel: *See*—
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Nakabayashi, Hirohiko: *See*—
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Noda, Kanji; Nakagawa, Akira; and Ide, Hiroyuki, 3,922,275.
Nakamura, Yasuharu: *See*—
Matsuyama, Junichi; Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,922,556.
Nakamura, Yoshikatsu, to Nippon Piston Ring Co., Ltd. Sliding member. 3,922,444, Cl. 428-457.000.
Nakane, Takeshi: *See*—
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Nakao, Masaru: *See*—
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.
Nakayama, Takeo. Magnetic medical treatment device. 3,921,620, Cl. 128-1.300.
Nakayama, Yuya: *See*—
Umezawa, Hamao; Nakayama, Yuya; Kunishima, Mamoru; and Matsubara, Midori, 3,922,262.
Nakayashiki, Kenji, to Seiwa Kosan, Ltd. Method of drying lumber. 3,921,309, Cl. 34-13.800.
Nakazawa, Yoshiyuki: *See*—
Matsuyama, Junichi; Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,922,556.
Nanba, Yasuhiro: *See*—
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Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kohagura, Masahiro; and Takahashi, Itaru, to Kyowa Hakko Kogyo Co., Ltd. Antibiotic XK-49-1-B-2 and process for production thereof using streptosporangium violaceochromogenes. 3,922,343, Cl. 424-116.000.
Narayan, Thirumurti L.; and Cenker, Moses, to BASF Wyandotte Corporation. Carbodiimide-isocyanurate foams containing urethane linkages. 3,922,238, Cl. 260-2.5BF.
Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, to Thomson-CSF. Surveillance system for monitoring traffic in localized areas of a route. 3,922,636, Cl. 340-24.000.
Naro, Rodney L.: *See*—
Skubon, Michael J.; Spiwak, John J.; and Naro, Rodney L., 3,922,245.
National Distillers and Chemical Corporation: *See*—
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National Factors, Inc.: *See*—
Cetrulo, Frank A., Jr., 3,921,375.

National Forge Company: *See*—
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NCR Corporation: *See*—
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Toft, Roger D.; and Froman, Richard M., 3,921,516.
Neal, James Henry. Oil spill containing boom. 3,921,407, Cl. 61-1.00F.
Neau, Alain: *See*—
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Nebraska Technical Equipment Company: *See*—
LaBarber, Joseph A., 3,921,255.
Neel, Phoebe B. Cervical collar having removable color coordinated cover. 3,921,626, Cl. 128-75.000.
Neff, Engelbert; and Fehr, Jakob, to Maschinenfabrik u. Giessuei Netstal AG. Injection molding machine construction and method of operation. 3,921,963, Cl. 259-191.000.
Negishi, Tokuji; and Yoshida, Motomasa, to Clarion Co., Ltd. Playing method of tape player and an equipment thereof. 3,922,719, Cl. 360-88.000.
Nelsen, Duane H.: *See*—
Votroubek, Leland C.; and Nelsen, Duane H., 3,921,761.
Nelson, Charles W., to General Electric Company. Fastening device for hingedly assembling members. 3,921,253, Cl. 16-172.000.
Nelson, Jerome W.; Nay, Earl B.; Wittman, Eric W.; and Pollock, Robert E., deceased (by Pollock, Peggy, executrix), to CRC-Crose International, Inc. Welding method and apparatus. 3,922,517, Cl. 219-61.000.
Nelson, Norman A., to Upjohn Company, The. 3-Oxa prostaglandin B-type compounds. 3,922,298, Cl. 260-468.00D.
Nelson, Roy A., to LTV Aerospace Corporation. Transportation system and vehicle thereof. 3,921,532, Cl. 104-130.000.
Nespesny, Zbynek: *See*—
Pech, Josef; Kriz, Vladimir; and Nespesny, Zbynek, 3,921,676.
Nesselt, Norman F. Golf ball retriever. 3,922,027, Cl. 294-19.00A.
Nesson, Israel; and Graham, Thomas G., to Berkey Photo, Inc. Camera construction. 3,922,690, Cl. 354-49.000.
Nestork, William J.: *See*—
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Neumann, Gernot: *See*—
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New Kon Industrial Co., Ltd.: *See*—
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Newby, Ronald: *See*—
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Newcomb, Gilbert S., Jr.; and Langan, Leon V., Jr., to Environmental Measurements, Inc. Air quality sampler. 3,921,456, Cl. 73-421.50R.
Newell, Alan Francis: *See*—
Beynon, John David Emrys; Newell, Alan Francis; Maddock, Robert John; and Stevenson, Robert Andrew, 3,922,646.
Newman, Douglas A.: *See*—
Brown, Albert E.; Schlotzhauer, Allan T.; and Newman, Douglas A., 3,922,438.
Ney, Karl Heinz; Wirotana, I. Poetoe Gde; and Freytag, Wolfram Gustav, to Lever Brothers Company. Cheese flavor (amino acids). 3,922,365, Cl. 426-534.000.
Nicholls, Bryan Frederick: *See*—
Warren, Anthony Charles; and Nicholls, Bryan Frederick, 3,922,590.
Nickmeyer, Walter V.; and Simmons, Raymond L., to Rama Corporation. Thermostat heater. 3,922,528, Cl. 219-523.000.
Nielsen, Bendix: *See*—
Andersen, Helge Hojmark; and Nielsen, Bendix, 3,921,727.
Nieman, John R.: *See*—
Frantzreb, John G., Sr.; and Nieman, John R., 3,921,700.
Niimi, Itaru: *See*—
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; Kondo, Katsumi; Morita, Akiyoshi; Koyama, Mototsugu; Sato, Mitsuyoshi; and Miyazaki, Shoji, 3,922,234.
Nilson, Billy N. Disabling device for dispenser for tablets. 3,921,851, Cl. 221-151.000.
Nimmo, Philip E., Jr.; and Steller, Arthur H. Circular generating pompon bow structure. 3,922,407, Cl. 428-5.000.
Nippon Electric Co., Inc.: *See*—
Kodama, Yukuo; and Ando, Tsuyoshi, 3,922,566.
Uchida, Teiji, 3,922,062.
Nippon Electric Company Limited: *See*—
Eguchi, Iwao; Shimamura, Tadao; and Takimoto, Yukio, 3,922,570.
Nippon Hoso Kyokai: *See*—
Goto, Naohiro; Izozaki, Yukinao; Shidara, Keiichi; Maruyama, Eiichi; Hirai, Tadaaki; Inao, Kiyohisa; and Mori, Ikue, 3,922,579.
Nippon Kayaku Kabushiki Kaisha: *See*—
Umezawa, Hamao; Nakayama, Yuya; Kunishima, Mamoru; and Matsubara, Midori, 3,922,262.
Nippon Kokan Kabushiki Kaisha: *See*—
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Nippon Piston Ring Co., Ltd.: *See*—
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Nippon Toki Kabushiki Kaisha (Noritake Co. Ltd.): *See*—
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Nishida, Shoichi: *See*—
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Nishinomiya, Makoto: *See*—
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Nishio, Yasuhiro; Yonekubo, Hirosi; Matuzawa, Takeo; Hanamura, Tosiki; and Ishibayashi, Kunimoto, to Showa Denko Kabushiki Kaisha; and Kyoei Kenmazai Company, Limited. Method and apparatus for blasting. 3,921,336, Cl. 51-9.00R.
Nissan Motor Company Limited: *See*—
Aono, Shigeo, 3,921,612.
Hosoda, Toru; and Seki, Mitsuru, 3,921,465.
Koike, Yoshitaka; and Yabuta, Keiichiro, 3,922,020.
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Noda, Kanji; Nakagawa, Akira; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. Pyrido[2,3-D] pyrimidine-2,4(1H,3H)-diones. 3,922,275, Cl. 260-256.40F.
Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Method of converting circular scanning lines into linear scanning lines. 3,922,059, Cl. 350-3.500.
Noguchi, Masaru: *See*—
Oosaka, Shigenori; Noguchi, Masaru; and Takahashi, Tsunehiko, 3,922,060.
Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purification system. 3,921,396, Cl. 60-290.000.
Norda Incorporated: *See*—
Galluzzi, John F.; Saldarini, Albert V.; and Murray, Thomas E., 3,922,354.
Nordling, K. Fredrik, to Dicom Systems Ltd. Adaptive delta modulation information transmission system. 3,922,606, Cl. 325-38.00B.
Nordsiek, Karl-Heinz: *See*—
Berg, Gerhard; Nordsiek, Karl-Heinz; and Barnstedt, Egge, 3,922,240.
Nordson Corporation: *See*—
Hogstrom, Edwin F.; and Vilagi, Burton J., 3,921,570.
Noritake, Muneo; and Takeuchi, Masaharu, to Ina Seito Co., Ltd. Kiln for tile. 3,922,140, Cl. 432-122.000.
North American Philips Corporation: *See*—
Pitcher, Gerald K., 3,921,400.
North, Joyce A.; and Kuckro, Gerard W., to National Distillers and Chemical Corporation. Flame retardant compositions. 3,922,442, Cl. 428-447.000.
Norton, David John; and Corrie, John Douglas, to Westinghouse Brake & Signal Co. Ltd. Vehicle speed control arrangement. 3,921,946, Cl. 246-182.00A.
Novak, Arne: *See*—
Colding, Bertil; Novak, Arne; and Sandstrom, Unto, 3,922,094.
Nowak, Herbert: *See*—
Pohlke, Rolf; Mehrhof, Werner; Becker, Karl-Heinz; Schliep, Hans-Jochen; Nowak, Herbert; and Simane, Zdenek, 3,922,261.
Noyes, Androus D.; and Marona, Robert N. Collapsible container and package. 3,921,897, Cl. 229-41.00R.
Nute, Ernest B., Jr.; Jones, Paul H.; and Vasaturo, Frank J., to Armstrong Cork Company. Joint structure for suspended ceiling system member. 3,921,365, Cl. 52-758.00A.
Nye, James Leroy; Barr, Samuel Rothrock; Chew, Thomas; and Steyer, William, to General Electric Company. Infrared suppression system for a gas turbine engine. 3,921,906, Cl. 239-127.300.
Oaks, Daniel V., to MacLean-Fogg Lock Nut Co. Debris ejecting means for pierce nut applying tool. 3,921,276, Cl. 29-208.00D.
Obermeier, Cornelius: *See*—
Adam, Fritz G.; Obermeier, Cornelius; Scheffer, Gerhard; and Wilmsmeyer, Klaus, 3,922,567.
Obermeier, James A.: *See*—
Vandale, Leonard A.; and Obermeier, James A., 3,921,795.
O'Berry, William A.; Fox, Eugene R.; and Plante, Kenneth L., to United States of America, Navy. Signal sorting device. 3,922,676, Cl. 343-17.1PF.
Occidental Petroleum Corporation: *See*—
Logan, Forrest E., 3,921,458.
Ochiai, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Skid control braking system. 3,922,022, Cl. 303-21.00P.
Ochiai, Yukihiro: *See*—
Yusa, Haruhiko; and Ochiai, Yukihiro, 3,922,321.
Ochsner, Arnold G. Dual surface textiles. 3,922,399, Cl. 427-261.000.
Oesterle, Helmut: *See*—
Braun, Josef; Hartmann, Manfred; and Oesterle, Helmut, 3,921,495.

Ohi, Reiichi: *See—*
Matsuyama, Junichi; Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,922,556.

Ohmann, William: *See—*
Kretchman, Gerald L.; and Ohmann, William, 3,921,421.

Ohno, Akihisa: *See—*
Onoda, Takeru; Yamura, Akira; Ohno, Akihisa; Haji, Junzo; Toriya, Jun; Sata, Masato; and Ishizaki, Naoatsu, 3,922,300.

Oiles Kogyo Kabushiki Kaisha: *See—*
Kitta, Toshiyuki; Miyata, Shohiko; Fukunaga, Tatsumi; and Kasahara, Mataichi, 3,922,437.

Ojima, Shin; Yoshimura, Tooru; Oogami, Kazuhiko; and Umezaki, Aitaka, to Hoshidenkiseizo Kabushikikaisha. Echo microphone of the handy type. 3,922,489, Cl. 179-1.00J.

Okachi, Ryo: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kohagura, Masahiro; and Takahashi, Itaru, 3,922,343.

Okada, Hiroshi; Horibe, Hiroshi; Mizuno, Yasushi; Yasui, Shoji; Ikegaya, Kazuo; and Suzumura, Nobuo, to Fukuda Denshi Co., Ltd. Heart beating examining apparatus. 3,921,623, Cl. 128-2.05P.

Okajima, Shigeaki: *See—*
Takehara, Kikuo; Okajima, Shigeaki; Komori, Saburo; and Agawa, Toshio, 3,922,303.

Okamoto, Tadashi: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,922,264.

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Okura Yusoki Kabushiki Kaisha: *See—*
Suizu, Dairi, 3,921,828.

Older, Robert B.; and Smith, Charles W., to Bunker-Ramo Corporation, The. Coaxial circuit construction and method of making. 3,922,479, Cl. 174-68.500.

Olin Corporation: *See—*
Ford, James A.; and Butt, Sheldon H., 3,921,886.
McLain, Charles D., 3,921,883.

Oliver, David W.: *See—*
Hall, Patrick H.; and Oliver, David W., 3,921,391.

Olsen, Everett O., to Foxboro Company, The. Heated wire servo motor control system. 3,922,591, Cl. 318-676.000.

Olshvang, Jury Nikolaevich: *See—*
Tomilov, Boris Vasilievich; Olshvang, Jury Nikolaevich; and Kozhevnikova, Ljudmila Ivanovna, 3,921,441.

Olson, Maynard H.: *See—*
Schuster, John M.; and Olson, Maynard H., 3,922,143.

Onai, Atushi: *See—*
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O'Neil, Robert A., to Beneke Division, Beatrice Foods Co. Water closet seat and lift cover. 3,921,235, Cl. 4-234.000.

Ono, Giichiro: *See—*
Taira, Mitsuru; and Ono, Giichiro, 3,921,444.

Ono, Keiichi: *See—*
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.

Ono Pharmaceutical Co., Ltd.: *See—*
Hayashi, Masaki; Kori, Seiji; and Iguchi, Yoichi, 3,922,301.

Ono, Tsuyoshi: *See—*
Inami, Mamoru; Tanaka, Yoshiaki; and Ono, Tsuyoshi, 3,922,666.

Onoda, Takeru; Yamura, Akira; Ohno, Akihisa; Haji, Junzo; Toriya, Jun; Sata, Masato; and Ishizaki, Naoatsu, to Mitsubishi Chemical Industries Ltd. Process for preparing an unsaturated ester. 3,922,300, Cl. 260-497.00A.

Oogami, Kazuhiko: *See—*
Ojima, Shin; Yoshimura, Tooru; Oogami, Kazuhiko; and Umezaki, Aitaka, 3,922,489.

Oosaka, Shigenori; Noguchi, Masaru; and Takahashi, Tsunehiko, to Fuji Photo Film Co., Ltd. Hologram recording device. 3,922,060, Cl. 350-3.500.

Opas, George F., to Motorola, Inc. Antenna pattern generator and switching apparatus. 3,922,685, Cl. 343-854.000.

Openshaw, Alexander N.: *See—*
Dyck, Lloyd R.; and Openshaw, Alexander N., 3,921,474.

Optasound Corporation: *See—*
Castagna, John Frank, 3,922,075.

Opti-Holding AG: *See—*
Frohlich, Alfons, 3,921,260.

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Ros, Bonifacio Echavarri, 3,922,386.

Orentreich Medical Group: *See—*
Vogelman, Joseph H., 3,921,624.

Orlens, Alfreds, to Pitney-Bowes, Inc. Printing disc having bifurcated type arms. 3,921,784, Cl. 197-54.000.

Orloff, Leslie M., to Kenilworth Research & Development Corporation. Static reader for encoded record. 3,922,529, Cl. 235-61.11H.

Ortega, Pablo Cortina. Method of and means for multi-story building construction. 3,921,362, Cl. 52-745.000.

Orthuber, Richard Kaspar, to International Telephone and Telegraph Corporation. Channel plate electron multiplier adjacent color dot screen. 3,922,577, Cl. 313-105.000.

Orton, Geoffrey Keith: *See—*
Smythe, George Edward; and Orton, Geoffrey Keith, 3,921,628.

Osborn, Jack S., to Ree-Born Industries. Pipe slitter apparatus. 3,921,482, Cl. 83-185.000.

Osborne, Charles William, deceased; and Osborne, Weymar Zack, executor. Cattle feed treated with air exposed to ultraviolet and high voltage. 3,922,349, Cl. 426-2.000.

Osborne, Weymar Zack, executor: *See—*
Osborne, Charles William, deceased; and Osborne, Weymar Zack, executor, 3,922,349.

Oshima, Keisuke; Yasumoto, Takaya; Higashikuze, Michiaki; and Kawamoto, Masanari, to Toray Industries, Inc. Form composite structures. 3,922,414, Cl. 428-130.000.

Otis Engineering Corporation: *See—*
McCollum, Robert W., 3,921,719.

Otrhalek, Joseph V.; and Gansser, Robert E., to BASF Wyandotte Corporation. Method for improving the readability during optical scanning of automatic car identification labels. 3,922,390, Cl. 427-162.000.

Otsuka, Kanji: *See—*
Kawanobe, Toru; and Otsuka, Kanji, 3,922,400.

Otsuka, Katsumi; Yoshizawa, Kosaku; Tamura, Miyagi; Kondo, Koji; and Tsukamoto, Hideo, to New Kon Industrial Co., Ltd. Perforator for perforating a stack of paper sheets. 3,921,487, Cl. 83-467.000.

Otsuka Pharmaceutical Company Limited: *See—*
Miwa, Hideyuki, 3,922,340.

Outboard Marine Corporation: *See—*
Burkhardt, David J.; and Splittstoesser, Clair D., 3,922,024.
Kashmerick, Gerald E., 3,921,398.
Rubin, Robert M., 3,921,373.
Ward, Harry M., III, 3,921,702.

Overbeek, Gerhardus: *See—*
Pittie, Willem Hubert; Overbeek, Gerhardus; and Doig, Kingsley Ferguson, 3,922,330.

Overhead Door Corporation: *See—*
Hewitt, Lew V.; and Horton, Dee D., Jr., 3,921,335.
Smith, Vernon O., 3,921,241.

Owa, Masaru: *See—*
Kawasaki, Shigetake; Owa, Masaru; Hayano, Ichiro; Akiya, Takaji; Takeuchi, Norio; Goto, Totaro; and Ishizaka, Seiichi, 3,922,154.

Owens-Corning Fiberglas Corporation: *See—*
Bell, Reuben H.; and Foley, Kevin M., 3,922,436.
Bell, Reuben H.; and Foley, Kevin M., 3,922,466.
Foley, Kevin M.; and McCombs, Frank P., 3,922,472.
Plumberg, Leonard J., 3,922,425.

Owens-Illinois, Inc.: *See—*
Bayer, John W., 3,922,469.
Camp, Harold E.; and Grier, John D., 3,922,645.
Ellis, James L., 3,922,471.
Mumford, Eustace H.; and Rieck, Albert W., 3,921,504.
Randle, Edward L., Jr., 3,921,893.
Stengle, Edward J., Jr., 3,922,450.

Owens, J. C.: *See—*
Rich, Robert N.; and Owens, J. C., 3,921,739.

Oyoun, Sami, to Uniroyal A.G. Pneumatic tire breaker assembly. 3,921,692, Cl. 152-361.0FP.

Ozawa, Koji: *See—*
Sato, Hiroshi; Furukawa, Yosio; and Ozawa, Koji, 3,922,042.

P. R. Mallory & Co., Inc.: *See—*
Birt, Thomas W.; Sweany, Louis P.; and Pirtle, James D., 3,922,672.

Pacciarini, Antonio: *See—*
Bottasso, Franco; and Pacciarini, Antonio, 3,922,122.

Paisley, John C., to Gray Manufacturing Company. Partition construction. 3,921,347, Cl. 52-36.000.

Pako Corporation: *See—*
Gaskell, Alfred J., 3,922,702.

Palazzo, Ferdinando. Angularly movable obturator, particularly for controlling molten metal flow from containers or ladles. 3,921,866, Cl. 222-512.000.

Palencher, Jacques, to Societe Lebocey Industrie. Device for selecting a weft thread in a shuttleless loom supplied by external spools. 3,921,678, Cl. 139-122.000.

Palko, Zoltan: *See—*
Elliott, Donald Allan; and Palko, Zoltan, 3,921,888.

Palleson, Gormen C.: *See—*
Rossi, Joseph R.; Griffiths, Frederick J.; Griffin, James L.; and Palleson, Gormen C., 3,921,964.

Pallet Development Inc.: *See—*
Melnick, Dennis M.; and Kubick, Mark, 3,921,540.

Palm, Ronald K.: *See—*
Champion, Robert J.; Palm, Ronald K.; Harris, Jesse P. T., Jr.; and Kivett, William D., 3,921,821.

Palmer, Roland, to Hoechst Aktiengesellschaft. Correcting agent for photomechanically produced printing. 3,922,171, Cl. 106-23.000.

Pan-Nova, Inc.: *See—*
Formica, Thomas D.; Greenwood, Robert C.; and Jones, Thomas E., 3,921,854.

Pankove, Jacques Isaac, to RCA Corporation. Electroluminescent semiconductor device. 3,922,703, Cl. 357-17.000.

Pansini, Andrew L. Automatic swimming pool cleaner. 3,921,654, Cl. 134-167.00R.

Panzarino, Joseph N.: *See—*
Forker, Ray B., Jr.; and Panzarino, Joseph N., 3,922,452.

Pape, Hermann, to Gardisette Holding AG. Fittings for gathering and fixing curtains or drapes. 3,921,696, Cl. 160-330.000.

Park, Yong S.; and Pekosh, Raymond J., to Zenith Radio Corporation. Optical system for a lighthouse enclosure. 3,922,689, Cl. 354-1.000.

Parker-Hannifin Corporation: *See—*
Beck, Gerald H., 3,921,991.

Parliment, Thomas H.: *See—*
Dietrich, Paul; Thomas, Alan F.; Clinton, William P.; and Parliment, Thomas H., 3,922,310.
Dietrich, Paul; Thomas, Alan F.; Clinton, William P.; and Parliment, Thomas H., 3,922,351.

Parrish, Jack N., to Demac Engineering Ltd. Vehicle traction units. 3,921,743, Cl. 180-9.20C.

Passal, Frank, to M & T Chemicals Inc. Electrode position of alloys of nickel, cobalt or nickel and cobalt with iron and electrolytes therefor. 3,922,209, Cl. 204-43.00T.

Pathfinder Fund, The: *See—*
Beasley, W. B. Rogers; Morehead, Jean; Pendleton, Elaine; and Schmidt, George, 3,921,311.

Patterson, John W.; and Fried, John H., to Syntex (U.S.A.) Inc. Trans-prostaglandin-like compounds and methods. 3,922,289, Cl. 260-347.300.

Patterson, William C.; and Hill, Charles I., to Aluminum Company of America. Aluminous metal with glass beads bonded to a metal substrate. 3,922,433, Cl. 428-334.000.

Paulstra: *See—*
Bertin, Jacques, 3,921,992.

Pauze, Denis R.: *See—*
Holub, Fred R.; Cacciotti, Peter J.; and Pauze, Denis R., 3,922,252.

Pawson, Beverly Ann; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Polyene compounds. 3,922,287, Cl. 260-345.900.

Peabody Galion Corporation: *See—*
Herpich, William A., 3,921,839.

Pearce, Arnold: *See—*
Mitchell, Douglas Allison; and Pearce, Arnold, 3,921,590.

Pearce, Warren, Jr.: *See—*
Woofter, Robert C.; and Pearce, Warren, Jr., 3,922,480.

Pearson, Rune S. Coin mechanism. 3,921,779, Cl. 194-1.00L.

Pearson, Vernon W., to Greenlee Bros. & Co. Portable electric driven conduit bender. 3,921,424, Cl. 72-1.000.

Pech, Josef; Kriz, Vladimir; and Nespesny, Zbynek, to Vyzkumny ustav bavlnarsky. Warp let-off motion. 3,921,676, Cl. 139-110.000.

Peckingham, John F., to Vibra-Metrics, Inc. Electrical control systems of electromagnetic vibrators. 3,922,589, Cl. 318-126.000.

Peczeli, Charles F.; and Tyrcz, Edward T., to Gulf Oil Canada Limited. Apparatus for admixing fuel and combustion air. 3,922,137, Cl. 431-183.000.

Pedder, David John: *See—*
Douglas, Peter; Pedder, David John; Swallow, Peter John; and Davies, Terrence Ardern, 3,922,236.

Pekosh, Raymond J.: *See—*
Park, Yong S.; and Pekosh, Raymond J., 3,922,689.

Penders, Hubertus Carolus Marie. Drying of liqueform materials. 3,922,189, Cl. 159-4.00A.

Pendleton, Elaine: *See—*
Beasley, W. B. Rogers; Morehead, Jean; Pendleton, Elaine; and Schmidt, George, 3,921,311.

Peniston, Quintin P.; and Johnson, Edwin Lee. Process for depolymerization of chitosan. 3,922,260, Cl. 260-211.00R.

Penman, Richard E. Solid state touch operated switch. 3,922,563, Cl. 307-116.000.

Pennecot, Jean. Building composed of prefabricated elements. 3,921,355, Cl. 52-262.000.

Perkey, Preston R. Utility structure usable as electrical wiring equipment. 3,922,478, Cl. 174-53.000.

Pernichele, Albert D.; and Southard, William D., to Kennecott Copper Corporation. Acidification of precipitate copper slurry prior to filtration and drying. 3,922,167, Cl. 75-109.000.

Pero, Richard E., to Dow Chemical Company, The. Protective insert for lined flanged conduit. 3,921,673, Cl. 138-109.000.

Pert, Donald M.: *See—*
Reynolds, Edward B.; Pert, Donald M.; and Zanier, Aldo M., 3,921,732.

Peter, Reginald Charles: *See—*
Barnwell, George Derrick; and Peter, Reginald Charles, 3,922,457.

Peters, Howard M.; and Simon, Robert L., Jr., to United States of America, Energy Research and Development Administration. Fluorodinitroethyl difluoroformal and process of manufacture. 3,922,311, Cl. 260-615.00A.

Peters, Kenneth Donald, to RCA Corporation. Web advance mechanism. 3,921,879, Cl. 226-148.000.

Petersen, Christian C., to Polaroid Corporation. Dynamically compensated exposure control system. 3,922,698, Cl. 354-235.000.

Petersen, Niel R., to MTS Systems Corporation. Pressure balanced hydrostatic slip bearing used in a guide and restraint system. 3,921,286, Cl. 308-3.00R.

Peterson, Dwight R.: *See—*
Goldinger, John A.; and Peterson, Dwight R., 3,921,789.

Peterson, Viking Per, to SCA Development Aktiebolag. Mechanical refining of fiber material including steam recycle. 3,921,918, Cl. 241-28.000.

Petrik, George L.; and Dvorsky, James R., to FMC Corporation. Disconnect mechanism for upper section of crane. 3,921,817, Cl. 212-66.000.

Petry, Charles J., to Hazelett Strip-Casting Corporation. Method and apparatus for controlling the operating conditions in continuous metal casting machines having a revolving endless casting belt. 3,921,697, Cl. 164-4.000.

Pettis, Charles D. Alarm and utility meter reading system employing telephone lines. 3,922,490, Cl. 179-2.00A.

Petty, Preston Lynn. Headlight number plate. 3,921,323, Cl. 40-204.000.

Pfaff Industriemaschinen GmbH: *See—*
Gustmann, Kurt; and Souriseaux, Ludwig, 3,921,551.
Gustmann, Kurt; and Souriseaux, Ludwig, 3,921,553.

Pfau, Jean, to Ateliers Charmilles, S.A. Method for machining through intermittent pulse-controlled electric discharges. 3,922,518, Cl. 219-69.00M.

Pfeil, Emanuel: *See—*
Broemer, Heinz; Kaes, Hans-Herbert; and Pfeil, Emanuel, 3,922,155.

Pfister, Karl, to Kraftwerk Union Aktiengesellschaft. Surface level measuring device. 3,921,450, Cl. 73-295.000.

Pfizer Inc.: *See—*
Lipinski, Christopher A.; Stam, John G.; DeAngelis, Gerald G.; and Hess, Hans-Jurgen E., 3,922,345.

Phillips Petroleum Company: *See—*
Anderson, John E., 3,922,325.
Clampitt, Richard L., 3,921,733.
Cleary, James W., 3,922,250.
Hutchinson, William M., 3,922,228.
Mills, Kenneth R., 3,922,249.

Philo, Kenneth W. System and method of permafrost pile forming. 3,921,410, Cl. 61-53.520.

Pichelman, Franklin D., to Flo-Pac Corporation. Brush construction. 3,921,246, Cl. 15-207.000.

Picker, Elbert E.: *See—*
Koopman, Herbert J.; and Picker, Elbert E., 3,921,352.

Pierce, Frank D., to Bud Antle, Inc. Shipping container. 3,922,362, Cl. 426-396.000.

Pierdet, Andre: *See—*
Torelli, Vesperto; and Pierdet, Andre, 3,922,292.

Pierre, Mangin: *See—*
Roger, Dormenval; Laszlo, Havas; and Pierre, Mangin, 3,922,322.

Piguet, Paul: *See—*
Quaile, Henry; and Piguet, Paul, 3,922,041.

Pike, John E., to Upjohn Company, The. Prostaglandin E_1, F_1, and A_1 analogs. 3,922,297, Cl. 260-468.00D.

Pilkington P. E. Limited: *See—*
Rogers, Philip John, 3,922,072.

Pima Mining Company: *See—*
Huch, Richard O.; and Valles, Pedro, 3,921,810.

Pimental, David J.: *See—*
Munro, James M.; Pimental, David J.; Ramstad, David J.; and Hinves, John R., 3,921,943.

Pinchon, Pierre, to U.S. Philips Corporation. Vapour-phase deposition method. 3,922,467, Cl. 428-411.000.

Pioneer Electronic Corporation: *See—*
Yamamuro, Isao, 3,922,501.

Pirtle, James D.: *See—*
Birt, Thomas W.; Sweany, Louis P.; and Pirtle, James D., 3,922,672.

Pissiotas, Georg: *See—*
Martin, Henry; Rufener, Jacques; and Pissiotas, Georg, 3,922,158.

Pitcher, Gerald K., to North American Philips Corporation. Cryoelectric engine-refrigerator combination. 3,921,400, Cl. 60-517.000.

Pitel, Ira Jay, to GTE Sylvania Incorporated. Current limited oxcillator arrangement. 3,922,582, Cl. 315-106.000.

Pitney-Bowes, Inc.: *See—*
Carnes, W. Robert; Balogh, John J., Jr.; and Selnick, Lester L., 3,922,539.
Carnes, W. Robert, Jr., 3,921,518.
Carnes, W. Robert, Jr., 3,922,557.
Miciukiewicz, Joseph F., 3,921,974.
Orlens, Alfreds, 3,921,784.
Ritchie, Wayne W., 3,921,524.
Tramposch, Herbert, 3,921,277.

Pittet, Alan O.: *See—*
Schreiber, William L.; and Pittet, Alan O., 3,922,309.

Pittie, Willem Hubert; Overbeek, Gerhardus; and Doig, Kingsley Ferguson, to Swarsab Mining, Exploration & Development Company Limited. Separation and purification of platinum group metals and gold. 3,922,330, Cl. 423-22.000.

Plante, Kenneth L.: *See—*
O'Berry, William A.; Fox, Eugene R.; and Plante, Kenneth L., 3,922,676.

Plastronics, Inc.: *See—*
Mather, Byron L.; and Manschot, James G., 3,921,634.

Platt, Sidney S. Disposable glasses case. 3,921,797, Cl. 206-5.000.

Platzer, George E., Jr., to Chrysler Corporation. Thermocouple system having a PN junction for cold junction compensation. 3,921,453, Cl. 73-361.000.

Plegat, Alain Edouard, to Societe Anonyme des Usines Chausson. Method for checking tightness of hollow bodies and more particularly of heat exchangers, and device for embodying said method. 3,921,436, Cl. 73-40.000.

Plessey Company Limited, The: *See—*
Turner, Horace George, 3,922,113.

Plessey Handel und Investments A.G.: *See—*
Hall, Samuel Stewart, 3,922,625.
Wright, Hubert Charles, 3,922,684.

Pleus, Edwin F., to Aunt Nellie's Foods, Inc. Weighing apparatus. 3,921,737, Cl. 177-86.000.

Plumberg, Leonard J., to Owens-Corning Fiberglas Corporation. Roofing board for integration in a built-up roofing structure. 3,922,425, Cl. 428-291.000.

Plus Four, Inc.: *See*—
Wilson, Michael C., 3,921,477.

Pluschke, Manfred, to Kraftwerk Union Aktiengesellschaft. Apparatus for supplying cooling channels of rotors of electrical machines with cooling waters. 3,922,573, Cl. 310-53.000.

Pneumatic Scale Corporation: *See*—
Vergobbi, Robert W., 3,921,370.

Pohlke, Rolf; Mehrhof, Werner; Becker, Karl-Heinz; Schliep, Hans-Jochen; Nowak, Herbert; and Simane, Zdenek, to Merck Patent Gesellschaft mit beschrankter Haftung. Adenosine derivative. 3,922,261, Cl. 260-211.50R.

Polaroid Corporation: *See*—
Davis, Carl W., 3,922,694.
Petersen, Christian C., 3,922,698.
Scholz, Donald T., 3,921,880.
Sharp, John R., 3,921,322.

Politechnika Slaska im. Wincentego Pstrowskiego: *See*—
Gierek, Adam; Binczyk, Franciszek; and Kowalski, Andrzej, 3,922,211.

Pollock, Peggy, executrix: *See*—
Nelson, Jerome W.; Nay, Earl B.; Wittman, Eric W.; and Pollock, Robert E., deceased, 3,922,517.

Pollock, Robert E., deceased: *See*—
Nelson, Jerome W.; Nay, Earl B.; Wittman, Eric W.; and Pollock, Robert E., deceased, 3,922,517.

Pont, Dominique Etienne Louis. Air cushion vehicle. 3,921,753, Cl. 180-127.000.

Poole, Margaret A., to GTE Sylvania Incorporated. Memory and memory addressing system. 3,922,643, Cl. 340-172.500.

Portescap: *See*—
Quaile, Henry; and Piguet, Paul, 3,922,041.

Potenza, George W.: *See*—
Athas, Gregory R.; Draayer, Johannes; Malfese, William F.; Reynolds, Nigel J. E.; and Potenza, George W., 3,922,499.

Potter Electric Signal Co.: *See*—
Ward, David M., 3,921,989.

Potts, James E.: *See*—
Clendinning, Robert A.; Potts, James E.; and Cornell, Stephen W., 3,921,333.

Poundstone, William N., to Consolidation Coal Company. Method of mining with a programmed profile guide for a mining machine. 3,922,015, Cl. 299-1.000.

Pourrias, Bernard M.: *See*—
Fauran, Claude P.; Eberle, Jeannine A.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,922,280.

Power Reactor and Nuclear Fuel Development Corporation: *See*—
Yusa, Hideo; Kamiya, Kunio; Murata, Toshifumi; Yamaki, Hideo; and Hisatomi, Shigenobu, 3,922,150.

Powers, Joseph E., to Kaiser Steel Corporation. Drum closure. 3,921,850, Cl. 220-308.000.

PPG Industries, Inc.: *See*—
Carlin, William W.; and Darlington, William B., 3,922,231.
Dahlberg, John R.; and Grove, Robert H., 3,921,873.
Goldinger, John A.; and Peterson, Dwight R., 3,921,789.
Jerabek, Robert D.; and Marchetti, Joseph R., 3,922,253.

Prakash, Vinod, to Societe d'Assistance Technique pour Produits Nestle S.A. Food product and process for preparing same. 3,922,370, Cl. 426-559.000.

Prasse, Herbert F.; and McCormick, Harold E., to Ramsey Corporation (TRW Inc.). Piston and resilient plastic piston ring combination. 3,921,988, Cl. 277-168.000.

Preformed Line Products Company: *See*—
Appleby, Harry Allen; and Albert, Frank, Jr., 3,921,257.

Pressler, Earl David: *See*—
Hamrock, Edward M.; and Pressler, Earl David, 3,921,812.

Preston, Albert W., Jr.: *See*—
Preston, Thomas A.; and Preston, Albert W., Jr., 3,921,642.

Preston Metal and Roofing Products Limited: *See*—
Beynon, John O., 3,921,363.

Preston, Thomas A.; and Preston, Albert W., Jr. Automatic rate adjustment pacer with natural rate searching means and method of operation. 3,921,642, Cl. 128-419.0PG.

Pridgen, Robert H. Leg muscle exercise apparatus. 3,921,975, Cl. 272-83.00R.

Priester, Amos U., Jr., to Deering Milliken, Inc. Crushed pile fabric and method. 3,922,404, Cl. 427-369.000.

Prince, Thomas E.: *See*—
Cox, Joe T.; and Prince, Thomas E., 3,921,300.

Pro Products, Inc.: *See*—
Provi, Mike A., 3,921,306.

Procter & Gamble Company, The: *See*—
Whyte, David Denzil. 3,921,232.

Protein Foods (U.K.) Limited: *See*—
Whittle, Kenneth Frederick, 3,922,377.

Proudian, Andrew P.; Welkowsky, Murray S.; and Wright, Steven A., to Xonics, Inc. Virtual electrode imaging chamber. 3,922,547, Cl. 250-315.00A.

Provi, Mike A., to Pro Products, Inc. Carpenter's and mason's level. 3,921,306, Cl. 33-379.000.

Provine, Edgar B., III, to Dover Corporation. Vehicle lift adapter. 3,921,762, Cl. 187-8.750.

Pruvot, Francois C.; and Fayolle, Michel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Liquid-compression suspensions for automobile vehicles. 3,922,000, Cl. 280-124.00F.

Przybylski, Darius K.: *See*—
Kuske, Edward A.; and Przybylski, Darius K., 3,922,198.

Pugh, Toby Sydney, to Dresser Industries, Inc. Reversing mechanism for double-action hydraulic oil well pump. 3,922,116, Cl. 417-393.000.

Pulman, David Allen: *See*—
Elliott, Michael; Janes, Norman Frank; and Pulman, David Allen, 3,922,269.

Purt, Gustav: *See*—
Horvath, Zoltan; and Purt, Gustav, 3,922,656.

Quaile, Henry; and Piguet, Paul, to Portescap. Elastic pivot bearings. 3,922,041, Cl. 58-140.00A.

Quaker Oats Company, The: *See*—
Bernotavicz, John W., 3,922,353.

Qualtrough, John Geoffrey; Thornley, Harry; and Adams, David John, to TBA Industrial Products Limited. Production of sheet material for use as gaskets. 3,922,391, Cl. 427-174.000.

Quantz, Chester C., to Eltra Corporation. Four-phase alternator battery charger. 3,922,592, Cl. 320-15.000.

Quasar Microsystems, Inc.: *See*—
Totino, Peter J., 3,921,565.

Query, Grady W. Fluid distribution system. 3,921,722, Cl. 169-9.000.

Quick-Rotan Becker & Notz KG: *See*—
Daab, Heinz; and Kling, Rudolf, 3,921,770.

Quinn, Alton Dewitt: *See*—
Schreiber, William Lewis; Vock, Manfred; Hall, John B.; Shuster, Edward Joseph; and Quinn, Alton Dewitt, 3,922,237.

Quiry, Wilfred. Device for preventing fireplaces from smoking. 3,921,618, Cl. 126-120.000.

R. L. Drake Company: *See*—
Wysong, Ronald E., 3,922,607.

Raby, Claude: *See*—
Sach, Edgar; and Raby, Claude, 3,922,259.

Radiant Energy Systems, Inc.: *See*—
Livesay, William R., 3,922,546.

Radler, Richard William: *See*—
Bergfjord, John Alf; Grammatica, Steven James; and Radler, Richard William, 3,922,169.

Radmacher, Edmund; and Wullenweber, Paul. Elements for thin-layer chromatography. 3,922,431, Cl. 428-327.000.

Raduner and Co., AG: *See*—
Lauchenauer, Alfred E., 3,922,418.

Raether, Wolfgang; Diery, Helmut; and Cuntze, Ulrich, to Hoechst Aktiengesellschaft. Disinfectant compositions useful against protozoan oocysts. 3,922,344, Cl. 424-211.000.

Raether, Wolfgang: *See*—
Winkelmann, Erhardt; and Raether, Wolfgang, 3,922,277.

Rainey, jerry M.: *See*—
Grimes, Stephen L.; and Rainey, jerry M., 3,921,903.

Raithel, Elmer A.: *See*—
Julien, Fred E., Sr.; Raithel, Elmer A.; and Shafer, Carl W., 3,921,840.

Rama Corporation: *See*—
Nickmeyer, Walter V.; and Simmons, Raymond L., 3,922,528.

Ramsey Corporation (TRW Inc.): *See*—
Prasse, Herbert F.; and McCormick, Harold E., 3,921,988.

Ramstad, David J.: *See*—
Munro, James M.; Pimental, David J.; Ramstad, David J.; and Hinves, John R., 3,921,943.

Randle, Edward L., Jr., to Owens-Illinois, Inc. Container. 3,921,893, Cl. 229-23.00R.

Randolph, John H., to Courtaulds Engineering Limited. Process control apparatus for temperature control. 3,922,535, Cl. 235-151.100.

Rank Xerox Ltd.: *See*—
Honda, Ko, 3,922,548.
Miller, Laurence G., 3,921,972.

Raschke, Curt R.; and Toepke, Ival L., to Addressograph Multigraph Corporation. Reusable printing master and method of making same. 3,921,527, Cl. 101-463.000.

Rasenberger, Otto, to L. Schuler GmbH. Flying shear for dividing moving sheet-metal strip. 3,921,484, Cl. 83-320.000.

Rasmussen, Carl M.: *See*—
Rasmussen, Reed; and Rasmussen, Carl M., 3,921,843.

Rasmussen, Reed; and Rasmussen, Carl M. Camper loading and securing system. 3,921,843, Cl. 214-516.000.

Rathbun, William B., to University of Minnesota, The Regents of the. Poison ivy and poison oak treatment utilizing hydrophilic anion exchange material. 3,922,342, Cl. 424-79.000.

Raymond Lee Organization, Inc., The: *See*—
Flannery, Joe W., 3,921,324.
McGregor, Clifford A., 3,922,055.

Raynaud, Guy M.: *See*—
Fauran, Claude P.; Eberle, Jeannine A.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,922,280.

Raynes, John H.: *See*—
Kapteijn, Steven A. T.; and Raynes, John H., 3,921,557.

Raytheon Company: *See*—
Crowley, Arnold H.; Dunn, Allan G.; and Scharfenberger, Edward A., 3,922,550.
Gingras, Gerard J., Jr.; and Hanson, James T., 3,922,674.
Hapgood, William H., 3,921,961.
Toledo, Emil; Dzwonczyk, Luke; and Mo, Rodger Shih-Yah, 3,922,389.

RCA Corporation: *See*—
Hampel, Daniel; and Blasco, Richard William, 3,922,536.
Jones, Gary Arthur, 3,922,587.
Knox, Joseph Dale, 3,921,885.
Lozier, Gerald Scott, 3,922,394.

Lunsford, John Albert, 3,922,540.
McGuffin, William George; and Burgen, Robert Walter, 3,922,593.
Pankove, Jacques Isaac, 3,922,703.
Peters, Kenneth Donald, 3,921,879.
Ryan, Robert James, 3,922,416.
Sawicki, Frank Stanley, 3,922,049.
Schnable, George Luther; and Feldstein, Nathan, 3,922,420.
Smith, Bradford Knox, 3,922,395.

Reames, Sterling B., IV. Multi-indicating vacuum gauge. 3,921,454, Cl. 73-401.000.

Rebmann, Manfred; Rittler, Roland; Bischoff, Lothar; and Moser, Theo, to Robert Bosch Verpackungsmaschinen G.m.b.H. Apparatus for filling hard gelatin capsules or the like with powder. 3,921,681, Cl. 141-71.000.

Redken Laboratories, Inc.: *See*—
Yates, Robert W., 3,921,443.

Redman, Charles M., to United States of America, Army. Image integration and transfer plate. 3,922,576, Cl. 313-95.000.

Redshaw, Leonard, to Vickers Limited. Floatable vessel. 3,921,558, Cl. 114-.50T.

Ree-Born Industries: *See*—
Osborn, Jack S., 3,921,482.

Reed, Donald J.: *See*—
Walse, Alan S.; and Reed, Donald J., 3,921,769.

Reed, Geoffrey Ronald; and Knox, Barry Edward, to British Steel Corporation. Coil packaging, method and apparatus for forming same. 3,921,803, Cl. 206-389.000.

Reed, Norman Leonard: *See*—
Bennie, Annette; and Reed, Norman Leonard, 3,921,637.

Reese, Johannes; Kraft, Kurt; and Dick, Edgar, to Hoechst Aktiengesellschaft. Cyclic phosphonic acid esters. 3,922,323, Cl. 260-927.00R.

Reese, Richard G., to Combustion Power Company, Inc. Method and apparatus for particle collection in the exhaust of a fluid bed disposal apparatus. 3,921,544, Cl. 110-8.00F.

Regie Nationale des Usines Renault: *See*—
Froumajou, Armand, 3,921,602.
Pruvot, Francois C.; and Fayolle, Michel, 3,922,000.
Schaller, Jean-Pierre, 3,922,032.

Reichbach, Hyman. Bicycle rack. 3,921,868, Cl. 224-32.00A.

Reid, Allen Forrest; and Sinha, Hari Narayan, to Commonwealth Scientific and Industrial Research Organization; and Murphyores Incorporated Pty., Ltd. Treatment of ilmenite. 3,922,164, Cl. 75-1.000.

Reihm, Richard S. Packing device for frangible material. 3,921,890, Cl. 229-14.00C.

Reineman, Richard G. Lightweight, high strength, reinforced concrete constructions. 3,922,413, Cl. 428-119.000.

Reinhardt, Heinz: *See*—
Effenberger, Rudolf; Muller, Stefan; and Reinhardt, Heinz, 3,921,248.

Reintjes, Rudolf Carlo; and Hollander, Albert, to Bitumarin N.V.; and N. V. Asphalt-en Chemische Fabrieken Smid & Hollander. Method for the manufacture of broad sheets of coating material and application thereof in hydraulic engineering. 3,922,417, Cl. 428-192.000.

Renn, Donald W., to Marine Colloids, Inc. Medium for separation processes. 3,922,432, Cl. 428-327.000.

Rentmeester, Kenneth Richard, to American Can Company. Cemented lap seam container. 3,921,847, Cl. 220-64.000.

Renzi, Peter N., to American Standard, Inc. Heat exchanger structure for a compact boiler and the like. 3,921,712, Cl. 165-165.000.

Repka, Benjamin C.: *See*—
Blunt, Harry W.; and Repka, Benjamin C., 3,922,257.

Research Corporation: *See*—
Hulka, Jaroslav Fabian, 3,921,641.

Research Laboratories of Australia Pty. Limited: *See*—
Wright, Robert J., 3,921,579.

Research Products/Incinolet Corporation: *See*—
Blankenship, Ernest Bayne, 3,921,227.

Reslow, Lloyd Frederick: *See*—
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Resource Planning Associates, Inc.: *See*—
Woodman, David Edward, 3,921,901.

Restall, James Edward; and Weaver, Michael James Douglas, to National Research Development Corporation. Intermetallic compound materials. 3,922,168, Cl. 75-171.000.

Reynolds, Charles Edward, to AMP Incorporated. Connector for alphanumeric display panels. 3,922,051, Cl. 339-17.00C.

Reynolds, Edward B.; Pert, Donald M.; and Zanier, Aldo M., to Continental Oil Company. Detecting geopressured subterranean formations during drilling of a well. 3,921,732, Cl. 175-50.000.

Reynolds, John W.: *See*—
Wood, Loren E.; and Reynolds, John W., 3,921,556.

Reynolds, Nigel J. E.: *See*—
Athas, Gregory R.; Draayer, Johannes; Malfese, William F.; Reynolds, Nigel J. E.; and Potenza, George W., 3,922,499.

Rheinstahl Aktiengesellschaft: *See*—
Rosler, Norbert; Rudat, Willi Georg; and Albrecht, Erhard, 3,922,221.

Rheinstahl Huettenwerke AG: *See*—
Rohde, Ludwig Eugen; and Zimmermann, Erich, 3,921,703.

Rhoads, Jack L.: *See*—
Rhoads, James E., 3,921,609.

Rhoads, James E., to Rhoads, Jack L. Variable duration hydraulic valve tappet. 3,921,609, Cl. 123-90.550.

Rhodes, Richard P.: *See*—
DeLuca, John P.; Murrell, Lawrence L.; Rhodes, Richard P.; and Tauster, Samuel J., 3,922,235.

Rhone-Poulenc S.A.: *See*—
Ceyzeriat, Louis; and Letoffe, Michel, 3,922,246.
Janin, Raymond; and Krumenacker, Leon, 3,922,290.
Sauli, Michel, 3,922,281.

Riccio, Pasquale R., to Ciba-Geigy Corporation. Non-spitting liquid dispensing device. 3,921,857, Cl. 222-145.000.

Rice, Howard Gene; and Kitterman, Lawrence Peter. Tray stacking system. 3,921,826, Cl. 214-6.0FA.

Rich, Robert N.; and Owens, J. C., to Farmer Foundation Company; and Hughes Tool Company. Walking platform for drilling rigs and other heavy machinery. 3,921,739, Cl. 180-8.00C.

Richards, Elmer A., to Eaton Corporation. Transmission with resiliently loaded main shaft gears. 3,921,469, Cl. 74-339.000.

Rieck, Albert W.: *See*—
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Rieter Machine Works, Ltd.: *See*—
Wirz, Armin, 3,921,431.
Wust, Olivier, 3,921,922.

Rigassi, Norbert: *See*—
Klaui, Heinrich; Manz, Ulrich; Rigassi, Norbert; Ryser, Gottlieb; and Schwieter, Ulrich, 3,922,368.

Rist, Michel, to Societe Anonyme Francaise du Ferodo. Friction disc. 3,921,777, Cl. 192-107.00C.

Ritchie, Wayne W., to Pitney-Bowes, Inc. Rotary printer with removable printing die. 3,921,524, Cl. 101-329.000.

Rittler, Roland: *See*—
Rebmann, Manfred; Rittler, Roland; Bischoff, Lothar; and Moser, Theo, 3,921,681.

Rivers, Richard D., to American Air Filter Company, Inc. Method of forming a tapered pleated filter pleat fold separator and a separator formed thereby. 3,921,432, Cl. 72-362.000.

Robbins, Samuel B., to General Motors Corporation. Collision recorder. 3,921,463, Cl. 73-492.000.

Roberson, Glenn A., Jr.; Beaver, Robert I., II; and Kelly, Edward L., to Macronetics, Inc. Processing apparatus for thin disc-like workpieces. 3,921,788, Cl. 198-19.000.

Robert Bosch G.m.b.H.: *See*—
Links, Heinz, 3,921,604.

Robert Bosch Verpackungsmaschinen G.m.b.H.: *See*—
Rebmann, Manfred; Rittler, Roland; Bischoff, Lothar; and Moser, Theo, 3,921,681.

Robertshaw Controls Company: *See*—
Genbauffe, Francis S., 3,921,966.

Robertson Paper Box Co., Inc.: *See*—
Hackenberg, Robert A., 3,921,894.

Robin, Melvin Barry: *See*—
Koestler, Donald J.; and Robin, Melvin Barry, 3,922,255.

Robinson, Graham; and Jones, Ivor Wynn, to Electricity Council, The. Electrochemical cells having a liquid alkali metal electrode. 3,922,176, Cl. 136-6.0FS.

Robinson, Neil L.: *See*—
Johnson, Larry A.; Robinson, Neil L.; Strang, Richard H.; and Vair, Gary G., 3,921,340.

Robintech Incorporated: *See*—
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Rockwell International Corporation: *See*—
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Rodenberger, Phillip R.: *See*—
Cerny, Daryl D.; and Rodenberger, Phillip R., 3,921,526.

Roecker, Robert F., to Armstrong Cork Company. Secondary backing for carpeting. 3,922,454, Cl. 428-95.000.

Roemming, Karl: *See*—
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,922,208.

Roger, Dormenval; Laszlo, Havas; and Pierre, Mangin, to Naphtachimie. Process for dry polymerization of olefins. 3,922,322, Cl. 260-878.00B.

Rogers, Philip John, to Pilkington P. E. Limited. Biocular magnifying lenses. 3,922,072, Cl. 350-220.000.

Rogers, Robert M., to Hobart Corporation. Motion detector for a weighing scale. 3,921,736, Cl. 177-1.000.

Rogers, Winston L. Bicycle carrying rack. 3,921,869, Cl. 224-42.03B.

Rohde, Ludwig Eugen; and Zimmermann, Erich, to Rheinstahl Huettenwerke AG. Water-cooled sliding mold for electro slag remelting. 3,921,703, Cl. 164-252.000.

Rohm & Haas Company: *See*—
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Rohr Industries, Inc.: *See*—
Ball, Charles W., 3,921,480.
Heath, Stephen D.; and Borbolla, Lorenzo, Jr., 3,921,412.

Rohrberg, Roderick G.: *See*—
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Rollei-Werke Franke & Heidecke: *See*—
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Roller Corporation of America: *See*—
Monett, Edward, 3,921,954.

Roos, Charles E.: *See*—
Lee, Jeh-Mann; and Roos, Charles E., 3,922,219.

Ros, Bonifacio Echavarri, to Orbaiceta, S.A. Process for the manufacture of small heat-generating printed circuits. 3,922,386, Cl. 427-96.000.

Rosback, Richard H., to Bendix Corporation, The. Sequentially actuated servomotor with a pressure differential limiter. 3,921,501, Cl. 91-32.000.

Rosciszewski, Jan J. Method and apparatus for generating steam by nuclear explosion with suppressed radiation and blast effects. 3,921,405, Cl. 60-644.000.

Rosen, Bernard Walter: *See*—
Motta, Salvatore; Rosen, Bernard Walter; and Vasilos, Thomas, 3,922,411.

Rosenkranz, Dieter; Bous, Karl; Schmidt, Roland; Engelhardt, Werner; and Vermehren, Gunter, to Hacoba Textilmaschinen GmbH & Co. KG. Apparatus for the continuous treatment of textile fibers. 3,921,419, Cl. 68-5.00D.

Rosenquist, Roger K., to AmRose Corporation. Peristalitic diaphragm pump structure. 3,922,119, Cl. 418-45.000.

Rosler, Norbert; Rudat, Willi Georg; and Albrecht, Erhard, to Rheinstahl Aktiengesellschaft. Process for conditioning sewage sludges. 3,922,221, Cl. 210-50.000.

Rossi, Joseph R.; Griffiths, Frederick J.; Griffin, James L.; and Palleson, Gormen C., to Maneely-Illinois, Inc. Water quench apparatus for coated tubing and the like. 3,921,964, Cl. 266-6.00R.

Rossler, Robert: *See*—
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

Roth, Shirley H., to Cities Service Oil Company. Novel sulfanilamide-aldehyde copolymer. 3,922,251, Cl. 260-72.500.

Rotter, Gerhard; Bleininger, Leonard S.; and Gertz, Robert L., to BASF Aktiengesellschaft. Tape transport apparatus. 3,921,933, Cl. 242-192.000.

Roussel-UCLAF: *See*—
Torelli, Vesperto; and Pierdet, Andre, 3,922,292.

Roveda, Fernando. Automatic apparatus for irrigation, with timer. 3,921,904, Cl. 239-70.000.

Roveti, Denes. Electrical receptacle tester for testing the mechanical and electrical characteristics of electrical service receptacles. 3,922,600, Cl. 324-51.000.

Rowell, Stephen Royce; and Hogan, David Charles, to Eastman Kodak Company. Auto bias control method. 3,922,380, Cl. 427-8.000.

Royal, Douglas E., to TRW Inc. Method of locating a radiating target. 3,922,533, Cl. 235-150.270.

Rubin, Robert M., to Outboard Marine Corporation. Power rake. 3,921,373, Cl. 56-16.600.

Rucker Control Systems: *See*—
Hobson, Howard C., Jr., 3,922,654.

Rudat, Willi Georg: *See*—
Rosler, Norbert; Rudat, Willi Georg; and Albrecht, Erhard, 3,922,221.

Ruder, Joseph M.; and Iles, Thomas L., to Garrett Corporation, The. Oxygen air enrichment method. 3,922,149, Cl. 55-21.000.

Rudewick, Charles J., III, to Speakman Company. Modular balanced pressure mixing valve with ceramic valve elements. 3,921,659, Cl. 137-98.000.

Ruegsegger, Walter. Conveyor installation with a screw conveyor. 3,921,545, Cl. 110-8.00R.

Rufener, Jacques: *See*—
Martin, Henry; Rufener, Jacques; and Pissiotas, Georg, 3,922,158.

Rumbaugh, Hugh M. Kitchen appliance for cooking food. 3,921,617, Cl. 126-21.00R.

Ruof, Edgar J., to Goodyear Aerospace Corporation. Maximum and minimum brake temperature indicator. 3,922,640, Cl. 340-57.000.

Rush, James B.: *See*—
Logan, Arthur D.; and Rush, James B., 3,921,674.

Russell, Peter John: *See*—
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Johnston, David Ernest; and Russell, Peter John, 3,921,990.

Ryan, Robert James, to RCA Corporation. Medium for recording phase holograms. 3,922,416, Cl. 428-172.000.

Ryhming, Inge: *See*—
Glenn, Lewis A.; Lemcke, Bo; and Ryhming, Inge, 3,921,915.

Ryser, Gottlieb: *See*—
Klaui, Heinrich; Manz, Ulrich; Rigassi, Norbert; Ryser, Gottlieb; and Schwieter, Ulrich, 3,922,368.

Sach, Edgar; and Raby, Claude, to Choay S.A. Polymers of the Kunitz inhibitors, new medicaments containing these polymers and method for their manufacture. 3,922,259, Cl. 260-112.500.

Saha, Narayan C.: *See*—
Hauffe, William L.; and Saha, Narayan C., 3,921,449.
Hauffe, William L.; and Saha, Narayan C., 3,921,662.

Sahara, Masayoshi: *See*—
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St. Onge, Eugene Raymond: *See*—
Bok, Hendrik Frederik; and St. Onge, Eugene Raymond, 3,921,796.

Saito, Fumitaka: *See*—
Mitsuda, Hisateru; Kawai, Fumio; Kuga, Mutsuo; Saito, Fumitaka; and Yamamoto, Aijiro, 3,922,363.

Saito, Mitsutaka: *See*—
Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; and Saito, Mitsutaka, 3,922,473.

Saito, Nobutaka. Writing implement. 3,922,100, Cl. 401-199.000.

Saito, Takeji: *See*—
Urai, Muneharu, 3,922,029.

Sakai, Yasuo. Apparatus for sorting out defective ones from a continuous supply of moldings of bottomed cylindrical shape such as cups. 3,921,808, Cl. 209-47.00R.

Sakakibara, Naoji; and Nakane, Takeshi, to Aisin Seiki Kabushiki Kaicha. Method and apparatus for automatically maintaining the speed of an automobile at a constant preselected value. 3,921,751, Cl. 180-108.000.

Sakashita, Hitoshi: *See*—
Uozaki, Seizo; and Sakashita, Hitoshi, 3,921,554.

Saldarini, Albert V.: *See*—
Galluzzi, John F.; Saldarini, Albert V.; and Murray, Thomas E., 3,922,354.

Salmon, Garland R., Jr.; and Sutherland, Marshall C., Jr., to Sutherland, Marshall C., Jr. Connector means for hollow rectangular tubing. 3,922,101, Cl. 403-292.000.

Sama, Stephen L.: *See*—
Kitchener, William R.; Sama, Stephen L.; and Tolles, Walter E., 3,922,532.

Sample, Thomas E., Jr.; and Tate, Jack F., to Texaco Inc. Scale control. 3,922,403, Cl. 427-340.000.

Sand, Ralph E.: *See*—
Bell, Richard J.; Wynn, John D.; Denton, George T.; Sand, Ralph E.; and Cornelius, David L., Jr., 3,922,374.

Sanders, Bobby G.: *See*—
Ayers, Bobby R.; Sanders, Bobby G.; and Hanvey, William E., 3,921,924.

Sandfort, Robert Melvin; and Bailey, Paul Townsend, to Monsanto Company. Field-accessed magnetic bubble replicator. 3,922,652, Cl. 340-174.0TF.

Sandstrom, Unto: *See*—
Colding, Bertil; Novak, Arne; and Sandstrom, Unto, 3,922,094.

Sanz, Manuel C.: *See*—
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Sarfati, Alberto Gustavo; and Vischiani, Giuseppe, to Sobrevin Societe de Brevets Industriels Etablissement. Thread feeder. 3,921,925, Cl. 242-47.120.

Sargent Industries, Inc.: *See*—
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Sarrell, Ivan D., to Koehring Company. Electrical winch drum rotation indicating system. 3,922,605, Cl. 324-166.000.

Sartorius, Guy, to Societe des Aciers Fins de l'Est. Continuous temperature measuring system for metallurgical furnaces. 3,921,452, Cl. 73-343.500.

Sasabe, Kaoru; Okino, Yoshihiro; and Hayami, Heijiro, to Matsushita Electric Industrial Co., Ltd. Color signal correction in a color facsimile. 3,922,711, Cl. 358-75.000.

Sasajima, Kikuo: *See*—
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.

Sasaki, Yasushi: *See*—
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Sata, Masato: *See*—
Onoda, Takeru; Yamura, Akira; Ohno, Akihisa; Haji, Junzo; Toriya, Jun; Sata, Masato; and Ishizaki, Naoatsu, 3,922,300.

Sato, Akira: *See*—
Shiba, Keisuke; and Sato, Akira, 3,922,170.

Sato, Hiroshi; Furukawa, Yosio; and Ozawa, Koji, to Hitachi, Ltd. Thrust bearing device. 3,922,042, Cl. 308-160.000.

Sato, Katsunori: *See*—
Katayama, Shigeo; Sato, Katsunori; Miyagawa, Tomoyuki; Takahashi, Hisateru; Kato, Takashi; Yoshizawa, Toshio; and Yamada, Yasuo, 3,921,921.

Sato, Mitsuyoshi: *See*—
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; Kondo, Katsumi; Morita, Akiyoshi; Koyama, Mototsugu; Sato, Mitsuyoshi; and Miyazaki, Shoji, 3,922,234.

Sato, Tadashi: *See*—
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Saucy, Gabriel: *See*—
Pawson, Beverly Ann; and Saucy, Gabriel, 3,922,287.

Sauer, Francis J., to Emerson Electric Co. Stator assembly with bore sleeve. 3,922,575, Cl. 310-214.000.

Sauer, Gale E.; and Mapes, Carl R., to National Gypsum Company. Fire retardant shaft wall. 3,921,346, Cl. 52-30.000.

Sauermilch, Rolf: *See*—
Dolata, Hans; and Sauermilch, Rolf, 3,921,490.

Sauli, Michel, to Rhone-Poulenc, S.A. Process for the preparation of 3-(O,O-diethyldithiophosphorylmethyl)-6-chloro-benzoxazolone. 3,922,281, Cl. 260-307.00C.

Saunders, Leslie Sargeant, to Zepernick, Gunther Paul; Watts, Roy Herbert; and Albert, Max. Rotary internal combustion engine. 3,921,595, Cl. 123-8.230.

Saunier Duval: *See*—
Calvin, Guy Edmond; and Costecalde, Andre Marcel, 3,921,592.

Savage, Phillip D., to Hall Ski-Lift Company, Inc. Cable grip tester. 3,921,536, Cl. 104-202.000.

Sawada, Hajime: *See*—
Yoshihara, Tetsuya; Sawada, Hajime; and Watanabe, Tetsuo, 3,921,274.

Sawicki, Frank Stanley, to RCA Corporation. Method of degassing a cathode-ray tube prior to sealing. 3,922,049, Cl. 316-19.000.

SCA Development Aktiebolag: *See—*
Peterson, Viking Per, 3,921,918.
Scales, Stanley R., to Hughes Tool Company. Wear resistant boronized surfaces and boronizing methods. 3,922,038, Cl. 308-8.200.
Scantlin, William J. Fish display device. 3,921,584, Cl. 119-5.000.
Schaar, Charles H., to Colgate-Palmolive Company. Diaper with pleat securing tape means. 3,921,638, Cl. 128-287.000.
Schack, Carl J.: *See—*
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Schaefer, Donald D.: *See—*
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Schaefer, Howard A., to Anchor Hocking Corporation. Reflective roadway marker. 3,922,066, Cl. 350-104.000.
Schaffer, Albert M., to NCR Corporation. Switched capacitor nonvolatile mnos random access memory cell. 3,922,650, Cl. 340-173.0CA.
Schaffner, Hans: *See—*
Hoerster, Herbert; and Schaffner, Hans, 3,922,423.
Schaller, Jean-Pierre, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Sliding roof device with a deflector. 3,922,032, Cl. 296-137.00J.
Scharfenberger, Edward A.: *See—*
Crowley, Arnold H.; Dunn, Allan G.; and Scharfenberger, Edward A., 3,922,550.
Schatz, Joel, to Knickerbocker Toy Co. Inc. Weighted, musical rolypoly toy construction. 3,921,331, Cl. 46-117.000.
Schebalin, Sergei, to Honeywell Inc. Method of making an encapsulated thick film resistor and associated encapsulated conductors for use in an electrical circuit. 3,922,388, Cl. 427-103.000.
Scheffer, Gerhard: *See—*
Adam, Fritz G.; Obermeier, Cornelius; Scheffer, Gerhard; and Wilmsmeyer, Klaus, 3,922,567.
Scheidig, Helmut: *See—*
Grof, Helmut Theodor; Sonntag, Heinrich Fritz; Scheidig, Helmut; and Wamser, Anton, 3,921,698.
Schein, Alan K., to Hercules Incorporated. Fluorescent colorants. 3,922,232, Cl. 252-301.20R.
Schenk, Walter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of free-flowing inorganic ammonium or potassium salts. 3,922,332, Cl. 423-268.000.
Schick-Kalb, Jurgen: *See—*
Kohlschutter, Hans Wolfgang; Unger, Klaus; and Schick-Kalb, Jurgen, 3,922,392.
Schild, Josef, to Vockenhuber, Karl; and Hauser, Raimund. Motion picture camera. 3,922,076, Cl. 352-169.000.
Schill & Seilacher, Verwaltung GmbH: *See—*
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Schinner, Edward N.: *See—*
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Schirtzinger, Joseph F., to Sea-Log Corporation. Ice cutting apparatus for vessels operating in ice covered waters. 3,921,560, Cl. 114-41.000.
Schliep, Hans-Jochen: *See—*
Pohlke, Rolf; Mehrhof, Werner; Becker, Karl-Heinz; Schliep, Hans-Jochen; Nowak, Herbert; and Simane, Zdenek, 3,922,261.
Schlotzhauer, Allan T.: *See—*
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Schlumberger Technology Corporation: *See—*
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Schmid, Rolyn A., to Bender Machine Works, Inc. Apparatus for automatically mixing a cleaning solution for automatic cleaning equipment for dairies or the like. 3,921,652, Cl. 134-58.00R.
Schmidlin, Albertus E. Precision liquid-handling instrument. 3,921,460, Cl. 73-425.600.
Schmidt, George: *See—*
Beasley, W. B. Rogers; Morehead, Jean; Pendleton, Elaine; and Schmidt, George, 3,921,311.
Schmidt, Karl Otto, to Gebrueder Schmidt, Firma. Spring balance. 3,921,738, Cl. 177-230.000.
Schmidt, Roland: *See—*
Rosenkranz, Dieter; Bous, Karl; Schmidt, Roland; Engelhardt, Werner; and Vermehren, Gunter, 3,921,419.
Schmiedel, Robert C.: *See—*
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Schmuck, Peter, to Hilti Aktiengesellschaft. Electropneumatic hammer. 3,921,729, Cl. 173-14.000.
Schnable, George Luther; and Feldstein, Nathan, to RCA Corporation. Method of making a semi-transparent photomask. 3,922,420, Cl. 428-210.000.
Schnee, William E. Self cleaning water tank for bovine animals. 3,921,587, Cl. 119-78.000.
Schneider, Walter. Garbage bin having means for suspending garbage sacks with open mouths. 3,922,046, Cl. 312-211.000.
Schnitzer, Emanuel; Grubbs, Thomas M., Sr.; and Nagy, Kornel, to H. B. Zachry Co. Heat exchanger. 3,921,713, Cl. 165-167.000.
Scholz, Donald T., to Polaroid Corporation. Multipurpose audio-visual cassette with isolation loop. 3,921,880, Cl. 226-181.000.
Schreiber, William L.; and Pittet, Alan O., to International Flavors & Fragrances Inc. Processes for producing alkenals and intermediates therefor. 3,922,309, Cl. 260-601.00R.
Schreiber, William Lewis; Vock, Manfred; Hall, John B.; Shuster, Edward Joseph; and Quinn, Alton Dewitt, to International Flavors & Fragrances Inc. Novel perfume compositions and perfumed articles containing di-lower alkyl and lower alkylene acetals of 2-and 3-phenyl pentenals. 3,922,237, Cl. 252-522.000.
Schreyer, Ralph C., to Du Pont de Nemours, E. I., and Company. Process for preparing p-phenylenediamine. 3,922,304, Cl. 260-578.000.
Schroder, Heinz-Jurgen: *See—*
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Schroeder, Collin H.; Lechnir, Richard J.; and Derse, Philip H., to Wisconsin Alumni Research Foundation. 22-Dehydro-homocholenic acid. 3,922,291, Cl. 260-397.100.
Schultz, Thomas E., to Minnesota Mining and Manufacturing Company. Cube-corner retro-reflective article. 3,922,065, Cl. 350-103.000.
Schulz, Friedrich: *See—*
Maul, Johann; Schulz, Friedrich; and Wittmaack, Klaus, 3,922,544.
Schulz, John E. Concentric rotary engine. 3,921,596, Cl. 123-8.270.
Schuster, John M.; and Olson, Maynard H., to Minnesota Mining and Manufacturing Company. Polycarbodiimide treatments. 3,922,143, Cl. 8-94.210.
Schwartz, Robert A. D. Light diffuser system. 3,922,073, Cl. 350-319.000.
Schwartzkopf, Peter: *See—*
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Schweitzer, James C., to Douyette, Melvin J., Sr., a part interest. Pick up clip device. 3,922,026, Cl. 294-19.00A.
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Scoggin, Barry Alan; and Knell, Harvey Albert, to Caterpillar Tractor Co. Upper frame structure. 3,921,834, Cl. 214-132.000.
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Sears, George Wallace, Jr., to Du Pont de Nemours, E. I., and Company. Process for polishing silicon and germanium semiconductor materials. 3,922,393, Cl. 427-215.000.
Seaver, Charles Richmond; and Sewell, Stephen Everett, II, to Du Pont de Nemours, E. I., and Company. Apparatus for collecting waste polymer. 3,922,126, Cl. 425-72.000.
Sedlmeir, Kate. Lavatory for dogs and other domesticated pets. 3,921,582, Cl. 119-1.000.
Seem, David M. Harvesting machine. 3,921,723, Cl. 171-14.000.
Seeman, Bronislav, to Schlumberger Technology Corporation. Methods and apparatus for stabilizing the gain of a radiation detector. 3,922,541, Cl. 250-256.000.
Seery, Robert F., to Julius Blum & Co., Inc. Hand rail construction. 3,922,453, Cl. 428-44.000.
Segawa, Masahiro; Kawakami, Yukichika; and Itoh, Mitsuru, to Kureha Kagaku Kogyo K.K. Method for lining surfaces with sheets of polyvinylidene fluoride. 3,922,186, Cl. 156-310.000.
Seidehamel, Richard J.; and Dungan, Kendrick W., to Mead Johnson & Company. 3',4'-Dihydroxy-2-(isopropylamino)acetophenone intraocular pressure lowering process. 3,922,348, Cl. 424-330.000.
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Sendzimir, Tadeusz. Process and apparatus for producing metal sheets of better flatness. 3,921,425, Cl. 72-4.000.
Sendzimir, Tadeusz. Process and apparatus for modifying the cross section of a slab. 3,921,429, Cl. 72-189.000.

Sentinella, Victor Edward. Extinguisher mountings. 3,921,950, Cl. 248-313.000.
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Sewell, Martha H.: *See*—
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Shah, Harshavadan C., to American Home Products Corporation. 2-Aryl-2-imidazoline-1-propionic acids and their esters. 3,922,282, Cl. 260-309.600.
Shames, Max. Vehicle brake warning light system accelerator pedal switch. 3,921,750, Cl. 180-103.000.
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Sharp, John R., to Polaroid Corporation. Photographic print holder. 3,921,322, Cl. 40-104.190.
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Shaw, Benjamin Chandler; and Crookshanks, Rex John, to Bendix Corporation, The. Digital system providing signals representative of frequency variations from a nominal frequency. 3,922,670, Cl. 340-347.00R.
Shaw, Michael J., to SCM Corporation. Lithographic printing plate and method of making the same. 3,922,441, Cl. 428-446.000.
Shaw, Philip E.; Daum, Sol J.; and Clarke, Robert L., to Sterling Drug Inc. Polyhydrophenanthrene diols. 3,922,312, Cl. 260-617.500.
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Shear, Jeff L., to KV Pharmaceutical Company. Sustained release medicant. 3,922,339, Cl. 424-22.000.
Sheehan, Robert T. Bag-turning stacking palletizer. 3,921,825, Cl. 214-6.00P.
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Sheldon, Edward Emanuel. Apparatus for producing x-ray images as radiographs. 3,922,523, Cl. 250-320.000.
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Smith, Bradford Knox, to RCA Corporation. Method for applying organic polymeric coating composition to ferrous-metal surfaces. 3,922,395, Cl. 427-247.000.
Smith, Burton H., to Columbus McKinnon Corporation. Overload prevention handle. 3,921,471, Cl. 74-523.000.
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Smith, Fred T., to Sargent Industries, Inc. Refuse collection apparatus. 3,921,832, Cl. 214-82.000.
Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Semiconductor voltage transformer. 3,922,571, Cl. 307-296.000.
Smith, George L. Fruit cleaner. 3,921,809, Cl. 209-98.000.
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Sneath, Michael Edwin, to Lever Brothers Company. Simulated soft fruits. 3,922,360, Cl. 426-573.000.
Snyder, Michael E., to E. J. Snyder & Co., Inc. Production of dyed fabrics. 3,921,377, Cl. 57-35.000.
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Speyer, Fred B., to TRW Inc. Hot melt compositions. 3,921,343, Cl. 51-323.000.
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Starkweather, Gary K.; and Kowalski, Robert P., to Xerox Corporation. Flying spot scanner with scan detection. 3,922,485, Cl. 178-7.600.
Staubli, Alfons; and Weber, Hans, to Haenni & Cie Aktiengesellschaft. Manometer. 3,921,455, Cl. 73-418.000.
Stedman, Robert N., to Caterpillar Tractor Co. Protective seat. 3,922,030, Cl. 296-65.00A.
Steffes, Robert J., to General Motors Corporation. Sealing material injector nozzle. 3,921,685, Cl. 141-310.000.
Stegmeier, William J. Apparatus for compacting a low density foam material into a high density foam material. 3,922,131, Cl. 425-223.000.
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Stengle, Edward J., Jr., to Owens-Illinois, Inc. Coated glass container and method for coating same. 3,922,450, Cl. 428-35.000.
Stephens, Dwight L.; and Lord, Jeffrey D., to Mobil Oil Corporation. Thermosetting water-based coatings. 3,922,244, Cl. 260-29.7UA.
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Stiner, Roy E.; and Johnston, John David, to Continental Industries, Inc. Liquid cooled meter riser. 3,922,008, Cl. 285-41.000.

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Lettini, Michael J.; and Stock, Howard P., 3,922,050.

Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,922,366.

Stoller, David A.: *See—*
Fleshman, James W.; Josephson, Edgar F.; and Stoller, David A., 3,921,537.

Stoltman, Donald D., to General Motors Corporation. Fuel controller for gas turbine engine. 3,921,390, Cl. 60-39.270.

Straight Jane Mops Limited: *See—*
Cook, Leslie George, 3,921,247.

Strain, Patrick J. Sea-water oil spill cleaning system. 3,922,225, Cl. 210-242.000.

Strang, Richard H.: *See—*
Johnson, Larry A.; Robinson, Neil L.; Strang, Richard H.; and Vair, Gary G., 3,921,340.

Stratabord Limited: *See—*
Barnwell, George Derrick; and Peter, Reginald Charles, 3,922,457.

Streamlight, Inc.: *See—*
Strowe, Robert J., 3,922,584.

Strike, Donald P., to American Home Products Corporation. 15-Ethynyl-11-deoxy PGE. 3,922,302, Cl. 260-514.00D.

Strinning, Olof Bo Sven; and Thurell, Karl-Erik, to Mjolkcentralen, Ekonomisk Forening. Production of high protein low calorie dairy spread. 3,922,376, Cl. 426-603.000.

Strowe, Robert J., to Streamlight, Inc. Arc lamp ignition and operating circuit. 3,922,584, Cl. 315-171.000.

Strunk, Manfred: *See—*
Voss, Alfred; Strunk, Manfred; Kroschel, Heinz; and Kreutz, Heinz Wilhelm, 3,921,937.

Stryker, Harry L., to General Motors Corporation. Plastic power semiconductor flip chip package. 3,922,712, Cl. 357-81.000.

Stunkard, Norman W., to Allis-Chalmers Corporation. Gas operator for an electric switch device. 3,922,562, Cl. 307-112.000.

Stupecky, Joseph Jaromir: *See—*
Kozak, Zdenek Vaclav; and Stupecky, Joseph Jaromir, 3,922,525.

Styers, James D.; and Styers, Paul H. Pocket-forming member with window therein. 3,921,319, Cl. 40-10.00R.

Styers, Paul H.: *See—*
Styers, James D.; and Styers, Paul H., 3,921,319.

Sudakas, Lev Girshovich: *See—*
Danjushevsky, Solomon Isaakovich; Liogonkaya, Rakhil Izrailevna; and Sudakas, Lev Girshovich, 3,921,717.

Sugawa, Takaaki. Gas-fuelled lighter. 3,922,139, Cl. 431-344.000.

Sugawara, Kokichi: *See—*
Esashi, Hanjiro; Urayama, Kiyosi; Kawamata, Katsuyoshi; Sugawara, Kokichi; and Tobe, Junichiro, 3,921,927.

Sugimoto, Yoshihiko: *See—*
Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,922,405.

Sugiura, Teruo; Takikawa, Yujiro; Miyamoto, Hiroshi; and Ishida, Nobuyasu, to Aisin Seiki Kabushiki Kaisha. Vehicle wet-type friction clutch. 3,921,778, Cl. 192-113.00B.

Suizu, Dairi, to Okura Yusoki Kabushiki Kaisha. Apparatus for transferring goods within a storage system. 3,921,828, Cl. 214-16.40C.

Sullivan, Daniel J.: *See—*
Moore, Robert A.; and Sullivan, Daniel J., 3,921,571.

Sumitomo Chemical Company, Limited: *See—*
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.
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Sumitomo Metal Industries, Ltd.: *See—*
Tozaki, Yasuyuki, 3,921,704.

Sundberg, Tommy Mikael. Decomposition toilet. 3,921,228, Cl. 4-131.000.

Sunder, Shyam: *See—*
Trepanier, Donald L.; and Sunder, Shyam, 3,922,274.

Sundstrand Data Control, Inc.: *See—*
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Survival Technology, Inc.: *See—*
Tischlinger, Edward A., 3,921,633.

Suska, Charles R., to Stanley Works, The. Long life hinge. 3,921,225, Cl. 16-136.000.

Suter, Ray K. Masking tape dispenser. 3,921,936, Cl. 242-55.200.

Sutherland, Marshall C., Jr.: *See—*
Salmon, Garland R., Jr.; and Sutherland, Marshall C., Jr., 3,922,101.

Suva, Tito; and Sanz, Manuel C., to Micromedic Systems, Inc. Automatic draft compensating circuit for digital spectrophotometer. 3,922,091, Cl. 356-93.000.

Suzuki, Hiroyuki: *See—*
Hayashida, Yoshihiro; and Suzuki, Hiroyuki, 3,922,657.

Suzuki, Ichiro; and Watanabe, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Steering column support structure for vehicles. 3,921,747, Cl. 180-78.000.

Suzuki, Takao; and Takenaka, Naoichi, to Mitsui Shipbuilding and Engineering Co., Ltd. Method of constructing a spherical tank or the like. 3,921,555, Cl. 113-116.00W.

Suzuki, Yasuo; Arimura, Iwao; and Matsuda, Akira, to Bridgestone Tire Company Limited. Pneumatic tire. 3,921,693, Cl. 152-362.00R.

Suzumura, Nobuo: *See—*
Okada, Hiroshi; Horibe, Hiroshi; Mizuno, Yasushi; Yasui, Shoji; Ikegaya, Kazuo; and Suzumura, Nobuo, 3,921,623.

Sven Casselbrant & Co.: *See—*
Casselbrant, Sven Gustav, 3,921,794.

Svensson, Stig; and Lindgren, Stig, to Bulten-Kanthal Aktiebolag. Cargo hook. 3,922,028, Cl. 294-82.00R.

Swaim, Frank H., to United States of America, Navy. Train resonant car-body rocking detector system. 3,921,945, Cl. 246-169.00R.

Swain, Ronald L.: *See—*
Caletti, Robert H.; Martin, Timothy W.; and Swain, Ronald L., 3,922,720.

Swallow, Peter John: *See—*
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Swander, Kenneth D., Jr., to Aeroquip Corporation. Automatic brake slack adjuster. 3,921,765, Cl. 188-79.50K.

Swarsab Mining, Exploration & Development Company Limited: *See—*
Pittie, Willem Hubert; Overbeek, Gerhardus; and Doig, Kingsley Ferguson, 3,922,330.

Sway, Boris. Self-contained molding kit for heat-liquifiable molding material. 3,921,801, Cl. 206-223.000.

Sweany, Louis P.: *See—*
Birt, Thomas W.; Sweany, Louis P.; and Pirtle, James D., 3,922,672.

Sweeney, Raymond G.; and Thyberg, Michael M., to Chromalloy American Corporation. Crowd gate for milking parlor holding areas. 3,921,586, Cl. 119-20.000.

Swisher, James Howe: *See—*
Fuchs, Edward Oscar; and Swisher, James Howe, 3,922,180.

Sword, Antony J.: *See—*
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Syntex (U.S.A.) Inc.: *See—*
Patterson, John W.; and Fried, John H., 3,922,289.

Syverson, Martelle J., to Fountain Industries, Inc. Drink dispenser with level control for supply tank. 3,921,855, Cl. 222-67.000.

Szabo, Andrew Thomas, to Marquette Metal Products Co. Clutch for providing intermittent rotary output from a source of continuous rotary power. 3,921,771, Cl. 192-12.0BA.

Sze, Morgan C.; and Luberoff, Benjamin J., to Lummus Company, The. Hydrolysis reactor. 3,922,147, Cl. 23-283.000.

Szenasi, Freddy R.; and Baldwin, Richard M., to Tubexpress Systems, Inc. Wheel assembly for a vehicle moving through a tubular conduit. 3,921,533, Cl. 104-138.00R.

Taber, Robert C.: *See—*
Gibbons, Carl B.; Sewell, Martha H.; and Taber, Robert C., 3,922,545.

Tabrah, Joseph G.: *See—*
McElhoe, Bruce A.; and Tabrah, Joseph G., 3,921,905.

Tabuchi, Shunichi, to Foster Electric Co., Ltd. Diaphragm for electroacoustic transducer. 3,922,502, Cl. 179-115.5PV.

Tabuchi, Shunichi, to Foster Electric Co., Ltd. Diaphragm for electroacoustic transducer. 3,922,503, Cl. 179-115.5PV.

Tachibana, Hiromichi: *See—*
Mizutani, Tadashi; and Tachibana, Hiromichi, 3,921,841.

Tacker, John J.: *See—*
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Tadewald, Thomas D., to Universal Oil Products Company. Electrically conductive fibers. 3,922,384, Cl. 427-87.000.

Taira, Mitsuru; and Ono, Giichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Frequency meter for vehicle running speed versus fuel consumption rate. 3,921,444, Cl. 73-114.000.

Takahashi, Hisateru: *See—*
Katayama, Shigeo; Sato, Katsunori; Miyagawa, Tomoyuki; Takahashi, Hisateru; Kato, Takashi; Yoshizawa, Toshio; and Yamada, Yasuo, 3,921,921.

Takahashi, Itaru: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kohagura, Masahiro; and Takahashi, Itaru, 3,922,343.

Takahashi, Masaoki; and Nishinomiya, Makoto, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for distributing raw materials into blast furnace. 3,921,831, Cl. 214-35.00R.

Takahashi, Tsunehiko: *See—*
Oosaka, Shigenori; Noguchi, Masaru; and Takahashi, Tsunehiko, 3,922,060.

Takaku, Masaaki; and Kawahito, Shiro, to Kao Soap Co., Ltd. Process for refining amines. 3,922,306, Cl. 260-583.00N.

Takano, Toshiichi, to Iwatsu Electric Co., Ltd. Pushbutton dialing system. 3,922,500, Cl. 179-84.0VF.

Takasawa, Seigo: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kohagura, Masahiro; and Takahashi, Itaru, 3,922,343.

Takata, Hiromi: *See—*
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Takayama, Masaharu: *See—*
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.

Takayama, Shigeru: *See—*
Toyoda, Takashi; Fukada, Tadayuki; Inoue, Masayuki; Takayama, Shigeru; Yui, Hiroshi; and Inoue, Takayuki, 3,922,427.

Takegami, Masao: *See—*
Maehara, Toshinori; Kimura, Yoshinobu; Takeuchi, Hirotoku; and Takegami, Masao, 3,921,887.

Takegawa, Yasuo: *See—*
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Takehara, Kikuo; Okajima, Shigeaki; Komori, Saburo; and Agawa, Toshio, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Process for the production of tertiary amines having higher alkyl group. 3,922,303, Cl. 260-570.50R.

Takenaka, Naoichi: *See—*
Suzuki, Takao; and Takenaka, Naoichi, 3,921,555.

Takenouchi, Tomoo: *See—*
Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, 3,922,519.

Takeuchi, Hirotoku: *See—*
Maehara, Toshinori; Kimura, Yoshinobu; Takeuchi, Hirotoku; and Takegami, Masao, 3,921,887.

Takeuchi, Masaharu: *See—*
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Takeuchi, Norio: *See—*
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Takeuchi, Shigeo, to Takeuchi Tekko Kabushiki Kaisha. Vehicle cleaning apparatus. 3,921,243, Cl. 15-21.00D.

Takeuchi Tekko Kabushiki Kaisha: *See—*
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Takikawa, Yujiro: *See—*
Sugiura, Teruo; Takikawa, Yujiro; Miyamoto, Hiroshi; and Ishida, Nobuyasu, 3,921,778.

Takimoto, Yukio: *See—*
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Tamura, Miyagi: *See—*
Otsuka, Katsumi; Yoshizawa, Kosaku; Tamura, Miyagi; Kondo, Koji; and Tsukamoto, Hideo, 3,921,487.

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Crowder, Billy L.; and Tan, Swie-In, 3,922,708.

Tanabe Seiyaku Co. Ltd.: *See—*
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Tanaka, Akira, to American Safety Equipment Corporation. Load bearing safety belt buckle construction. 3,921,262, Cl. 24-230.00A.

Tanaka, Yoshiaki: *See—*
Inami, Mamoru; Tanaka, Yoshiaki; and Ono, Tsuyoshi, 3,922,666.

Tanaka, Yoshihiro: *See—*
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.

Tanguy, Jean-Claude, to Commissariat a l'Energie Atomique. Device for the continuous analysis of samples especially by non-dispersive x-ray fluorescence. 3,922,542, Cl. 250-277.000.

Tanigawa, Shogo: *See—*
Yoshida, Fujio; Yamada, Akiharu; Tanigawa, Shogo; and Yokoyama, Takesi, 3,922,326.

Tannenbaum, Stanley, to Thiokol Corporation. Heterogeneous monopropellant compositions and thrust producing method. 3,921,394, Cl. 60-217.000.

Tarman, Paul B.: *See—*
Linden, Henry R.; Tarman, Paul B.; and Feldkirchner, Harlan L., 3,922,215.

Tashiro, Norio, to Tokyo Shibaura Electric Co., Ltd. Magnetron device. 3,922,612, Cl. 328-230.000.

Tate, Jack F., to Texaco Inc. Secondary recovery method. 3,921,715, Cl. 166-271.000.

Tate, Jack F., to Texaco Inc. Secondary recovery method. 3,921,716, Cl. 166-271.000.

Tate, Jack F., to Texaco Inc. Method for stimulating well production. 3,921,718, Cl. 166-307.000.

Tate, Jack F.: *See—*
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Tauster, Samuel J.: *See—*
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Taylor, Howard J. Game discs and storage box therefor. 3,921,983, Cl. 273-148.00R.

Taylor, Owen S.: *See—*
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TBA Industrial Products Limited: *See—*
Qualtrough, John Geoffrey; Thornley, Harry; and Adams, David John, 3,922,391.

Technicon Instruments Corporation: *See—*
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Tee-Pak, Inc.: *See—*
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Cohly, Mauj A., 3,922,356.

Teknekron, Inc.: *See—*
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Tektronix, Inc.: *See—*
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Teldix GmbH: *See—*
Gerstenmeier, Jurgen; and Korasiak, Wolfgang, 3,922,534.
Leiber, Heinz, 3,921,666.

Telefonaktiebolaget LM Ericsson: *See—*
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Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Kaiser, Reinhold, 3,922,706.

Telesco Brophey Limited: *See—*
Weber, Heinz, 3,921,655.

Tenneco Chemicals, Inc.: *See—*
Love, Fred E., 3,922,320.

Tennessee Valley Authority: *See—*
Lewis, Harry T., Jr.; and Getsinger, John G., 3,922,157.

Tennigkeit, Kalenen T. Combination highway flare and portable flare gun. 3,921,325, Cl. 42-1.00Z.

Teranishi, Tsugutomo; and Amano, Yoshiyuki, to Hitachi, Ltd. Steam power generator apparatus of the regenerative cycle type. 3,921,406, Cl. 60-660.000.

Terminal Data Corporation: *See—*
Burton, John S.; and Whitney, Ronald L., 3,922,084.

Terzian, Rouben T.; Glass, Marvin I., deceased; and Sonderling, Ernest, executor, to Marvin Glass & Associates. Articulated figure toy. 3,921,332, Cl. 46-161.000.

Tester, William W. Medication dispensing package. 3,921,804, Cl. 206-531.000.

Tewey, Robert T.; and Shanbhag, Sudhakar P., to General Foods Corporation. Juicy sausage analog and process. 3,922,352, Cl. 426-89.000.

Texaco Development Corporation: *See—*
Child, Edward T., 3,922,148.

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Barnes, Vernon M., Jr.; Gunn, Kenneth M.; and Slough, Carlton M., 3,921,457.
Brockington, James W., 3,922,319.
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McGahey, Dean C.; Vest, Eugene W.; and Mayer, Edward A., 3,921,682.
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Texas Instruments Incorporated: *See—*
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Cochran, Michael J.; and Grant, Charles P., Jr., 3,922,538.
Cunningham, James A.; Wakefield, Robert H., Jr.; and Guidry, Mark R., Jr., 3,921,282.
Harding, Wayne M.; Williams, Neal M.; and LeCocq, Andrew D., 3,921,385.
Kravchuck, Robert T., 3,922,513.
Shepherd, Glen C., 3,922,627.

Thackray, Malcolm, to Australian Atomic Energy Commission. Method of photo-etching and photogravure using fission fragment and/or alpha ray etch tracks from toned photographs. 3,922,206, Cl. 204-6.000.

Thakore, Kaushik H., to Bendix Corporation, The. Energy tester for testing blasting machines that detonate electro-explosive devices. 3,922,604, Cl. 324-111.000.

Thely, Maurice H.: *See—*
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., 3,922,338.

Thettu, Raghulinga R., to Xerox Corporation. Cleaning system for electrostatic reproducing apparatus. 3,921,573, Cl. 118-70.000.

Thevenaz, Jean A., to Bolex International SA. Cinematographic projector. 3,922,077, Cl. 352-202.000.

Thigpen, Ben B., to Western Geophysical Company of America. Towable seismic detector conveyance. 3,921,755, Cl. 181-122.000.

Thilo, Peer: *See—*
Tomkewitsch, Romuald V.; and Thilo, Peer, 3,922,677.

Thiokol Corporation: *See—*
Tannenbaum, Stanley, 3,921,394.

Thirion, Andre. Control apparatus for the starter motor for an automobile engine. 3,921,613, Cl. 123-179.0BG.

Thomas, Alan F.: *See—*
Dietrich, Paul; Thomas, Alan F.; Clinton, William P.; and Parliment, Thomas H., 3,922,310.
Dietrich, Paul; Thomas, Alan F.; Clinton, William P.; and Parliment, Thomas H., 3,922,351.

Thomas, Alfred William: *See—*
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Thomas, Hermann; Kreiter, Heinz; and Weber, Friedrich, to Maschinenfabrik Goebel GmbH. Sheet assembling apparatus. 3,921,968, Cl. 270-60.000.

Thome, Richard J., to Merck & Co., Inc. Watchman's tour recording system. 3,922,649, Cl. 340-173.00R.

Thompson, Arnold M. Ice skate honing tool. 3,921,341, Cl. 51-205.0WG.

Thompson, John H.; and Sims, David S., to United States of America, Navy. Underwater intrusion detecting system. 3,922,631, Cl. 340-3.00R.

Thompson, John Stewart, to Bell Telephone Laboratories, Incorporated. Compressed differential pulse code modulator. 3,922,619, Cl. 332-11.00D.

Thompson, Joseph Ausbon. Moist/dry lavatory and toilet tissue. 3,921,802, Cl. 206-225.000.

Thompson, Paige W., to General Electric Company. Thermal actuator. 3,921,402, Cl. 60-531.000.

Thompson, Thomas C., to Vicra Sterile, Inc. Catheter insertion device and method of catheter introduction. 3,921,631, Cl. 128-214.400.

Thomson-CSF: *See—*
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Thomson-Leeds, Company, Inc.: *See—*
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Thorn Electrical Industries Limited: *See—*
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Thornley, Harry: *See—*
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Thurell, Karl-Erik: *See—*
Strinning, Olof Bo Sven; and Thurell, Karl-Erik, 3,922,376.

Thurston, Inc.: *See—*
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Thyberg, Michael M.: *See—*
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Tidwell, Hubert. Wave motor. 3,922,013, Cl. 290-53.000.

Tietjen, Thomas A.: *See—*
Howard, Willard L.; and Tietjen, Thomas A., 3,921,577.

Tilley, James N., to Upjohn Company, The. Isocyanate-containing oligomeric polyanhydrides. 3,922,295, Cl. 260-453.0AR.

Tischlinger, Edward A., to Survival Technology, Inc. Finger grip device. 3,921,633, Cl. 128-218.00R.

Tobe, Junichiro: *See—*
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Tobey, Hubert E.; Hood, John W.; and Irvin, Dee L., to International Telephone and Telegraph Corporation. Rotary blade assembly. 3,921,485, Cl. 83-342.000.

Toepke, Ival L.: *See—*
Raschke, Curt R.; and Toepke, Ival L., 3,921,527.

Toft, Roger D.; and Froman, Richard M., to NCR Corporation. Multiple station label printing machine. 3,921,516, Cl. 101-91.000.

Tokico Ltd.: *See—*
Hayashida, Yoshihiro; and Suzuki, Hiroyuki, 3,922,657.
Katayama, Masayoshi, 3,921,710.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
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Tokyo Shibaura Electric Co., Ltd.: *See—*
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Tokyo Yogyo Kabushiki Kaisha: *See—*
Yoshihara, Tetsuya; Sawada, Hajime; and Watanabe, Tetsuo, 3,921,274.

Toledo, Emil; Dzwonczyk, Luke; and Mo, Rodger Shih-Yah, to Raytheon Company. Method for protectively coating magnetic wire. 3,922,389, Cl. 427-130.000.

Tolles, Walter E.: *See—*
Kitchener, William R.; Sama, Stephen L.; and Tolles, Walter E., 3,922,532.

Tomaszewski, Walter: *See—*
Spragg, Charles D.; and Tomaszewski, Walter, 3,922,123.

Tome, Floyd, to Eska Company. Snow blower safety chute. 3,921,315, Cl. 37-43.00R.

Tomezsko, Edward S. J.: *See—*
Mitchell, Maurice M., Jr.; and Tomezsko, Edward S. J., 3,922,315.

Tomilov, Boris Vasilievich; Olshvang, Jury Nikolaevich; and Kozhevnikova, Ljudmila Ivanovna. Acoustic head. 3,921,441, Cl. 73-71.5US.

Tomizuka, Shunichi: *See—*
Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, 3,922,519.

Tomkewitsch, Romuald V.; and Thilo, Peer, to Siemens Aktiengesellschaft. Method and apparatus for determining the position of surface vehicles. 3,922,677, Cl. 343-112.00R.

Tompkins, Lawrence K.; and Fallows, John. Vibrator. 3,922,043, Cl. 308-187.000.

Tooka, Takuzo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Automatic spinning system. 3,922,642, Cl. 340-172.500.

Toray Industries, Inc.: *See—*
Oshima, Keisuke; Yasumoto, Takaya; Higashikuze, Michiaki; and Kawamoto, Masanari, 3,922,414.
Tsujita, Yasuo; Kimura, Toshihiko; Yamashita, Shigeji; Yuki, Kazuo; and Asami, Hiroshi, 3,921,382.

Torelli, Vesperto; and Pierdet, Andre, to Roussel-UCLAF. Novel haptene steroids. 3,922,292, Cl. 260-397.100.

Torii, Tatsuki; Nagashima, Yoshihisa; Kitamura, Haruhiko; and Mori, Etsuo, to Dai Nippon Toryo Kabushiki Kaisha. White emitting phosphors. 3,922,233, Cl. 252-301.60S.

Torin Corporation: *See—*
Klonoski, Stephen W., 3,921,272.

Toriya, Jun: *See—*
Onoda, Takeru; Yamura, Akira; Ohno, Akihisa; Haji, Junzo; Toriya, Jun; Sata, Masato; and Ishizaki, Naoatsu, 3,922,300.

Toriyama, Kazuhisa: *See—*
Murao, Kenji; Toriyama, Kazuhisa; Kamezawa, Norimasa; and Kitamura, Teruo, 3,922,067.

Torrington Company, The: *See—*
Woodilla, John E., Jr.; Hunt, Gordon W.; and Green, Willard B., Jr., 3,922,181.

Torsch, Charles E.: *See—*
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Tosa, Tetsuya: *See—*
Chibata, Ichiro; Tosa, Tetsuya; Sato, Tadashi; and Yamamoto, Kozo, 3,922,195.

Toth, Endre Leslie, to Air Products and Chemicals, Inc. Ultrasonic pipe testing system. 3,921,440, Cl. 73-67.80S.

Totino, Peter J., to Quasar Microsystems, Inc. Telephone answering machine message received and footage indicator. 3,921,565, Cl. 116-114.00J.

Townsend Engineering Company: *See—*
Townsend, Ray T., 3,922,357.
Townsend, Ray T., 3,922,364.

Townsend, Harold J.: *See—*
Anschutz, James E.; Gibbs, Dale S.; and Townsend, Harold J., 3,922,451.

Townsend, Ray T., to Townsend Engineering Company. Method for injecting fluids into meat products. 3,922,357, Cl. 426-281.000.

Townsend, Ray T., to Townsend Engineering Company. Method of lubricating a meat emulsion. 3,922,364, Cl. 426-413.000.

Toyo Kogyo Co., Ltd.: *See—*
Kawata, Masayuki, 3,921,395.

Toyo Rubber Industry Co., Ltd.: *See—*
Shimahara, Yoichi; Shimada, Takashi; Kitamura, Shigeki; Miyanishi, Hiroshi; and Senda, Hiroshi, 3,922,639.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; and Saito, Mitsutaka, 3,922,473.

Toyoda Koki Kabushiki Kaisha: *See—*
Kikuchi, Makoto, 3,921,339.

Toyoda, Takashi; Fukada, Tadayuki; Inoue, Masayuki; Takayama, Shigeru; Yui, Hiroshi; and Inoue, Takayuki, to Mitsubishi Petrochemical Co., Ltd. Synthetic paper improved with respect to dusting trouble. 3,922,427, Cl. 428-308.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, 3,921,273.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; Kondo, Katsumi; Morita, Akiyoshi; Koyama, Mototsugu; Sato, Mitsuyoshi; and Miyazaki, Shoji, 3,922,234.
Kodama, Akira; Yaegashi, Mamoru; and Nishida, Shoichi, 3,922,080.
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Suzuki, Ichiro; and Watanabe, Hiroyuki, 3,921,747.
Taira, Mitsuru; and Ono, Giichiro, 3,921,444.

Tozaki, Yasuyuki, to Sumitomo Metal Industries, Ltd. Oxidation-free casting apparatus for continuous casting. 3,921,704, Cl. 164-259.000.

Tramposch, Herbert, to Pitney-Bowes, Inc. Method of making printing disc. 3,921,277, Cl. 29-418.000.

Treece, William D.: *See—*
Dennis, Ronald E.; and Treece, William D., 3,921,271.

Trepanier, Donald L.; and Sunder, Shyam, to Dow Chemical Company, The. Dihydro-1,2,4-triazinoquinazolines. 3,922,274, Cl. 260-248.0AS.

Trieunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., to Indian Head Inc. Crimped continuous filament yarn and method. 3,921,380, Cl. 57-140.00R.

Trimble, Lyne S.; and Ito, Florence A., to Trimble, Lyne S. Means and method for creating a visible display utilizing high sensitivity magnetochemical particles. 3,922,687, Cl. 346-74.100.

Tripp, Robert W., to Inductosyn Corporation. Position measurement system with provision for change of units of measurement. 3,922,671, Cl. 340-347.0SY.

Trutor, John; and Kovacs, Karl F. Combination tool for husbandry purposes. 3,921,725, Cl. 172-375.000.

TRW Inc.: *See—*
Goff, Raymon L., 3,921,669.
Hinrichs, John Michael, 3,921,956.
Royal, Douglas E., 3,922,533.
Speyer, Fred B., 3,921,343.

Tseung, Alfred Chan Chung; and Bevan, Howard Lynne, to National Research Development Corporation. Method of making catalyst having a perovskite structure, the resulting product and uses thereof. 3,922,204, Cl. 204-1.00T.

Tsuji, Tom T., to J.I.L. Corporation of America, Inc. Replacement radio receiving apparatus with adapter frame for in dash automotive installations. 3,922,047, Cl. 312-242.000.

Tsujita, Yasuo; Kimura, Toshihiko; Yamashita, Shigeji; Yuki, Kazuo; and Asami, Hiroshi, to Toray Industries, Inc. Method of making a covered elastic yarn. 3,921,382, Cl. 57-157.0TS.
Tsukamoto, Hideo: *See—*
Otsuka, Katsumi; Yoshizawa, Kosaku; Tamura, Miyagi; Kondo, Koji; and Tsukamoto, Hideo, 3,921,487.
Tsuruta, Yasuo. Self-cooling tire. 3,921,688, Cl. 152-330.00C.
Tu-N-One PWR: *See—*
Mason, Lloyd R., 3,921,404.
Tubeco, Inc.: *See—*
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Tubexpress Systems, Inc.: *See—*
Szenasi, Freddy R.; and Baldwin, Richard M., 3,921,533.
Tucker, Archie J.: *See—*
Dorland, E. Everett; Miller, Stephen H.; and Tucker, Archie J., 3,921,934.
Tuley, Dixon W. Measuring device. 3,921,301, Cl. 33-141.00R.
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Tuminaro, Raymond D.: *See—*
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Tunick, Allen A.: *See—*
Fuhrmann, Robert; Tunick, Allen A.; and Sifniades, Stylianos, 3,922,265.
Turner, Carlton E.; and Craig, John C., Jr., to University of Mississippi, The. Hypoglycemic compound and method of preparing. 3,922,263, Cl. 260-236.500.
Turner, Horace George, to Plessey Company Limited, The. Metered supply of liquids. 3,922,113, Cl. 417-79.000.
Turner, James E.; and Kenoff, Michael B., to Warner-Lambert Company. Hypothyroid serum control. 3,922,145, Cl. 23-230.00B.
Turner, James Keith: *See—*
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Tyme Valve Corporation: *See—*
Corliss, Robert F.; and Wilkinson, Frank, 3,921,667.
Tyrcz, Edward T.: *See—*
Peczeli, Charles F.; and Tyrcz, Edward T., 3,922,137.
Tyslauk, Willy; and Bargel, Gunther, to Gewerkschaft Eisenhutte Westfalia. Tunnelling machine on skids with extensible wheels. 3,922,016, Cl. 299-31.000.
Uchida, Teiji, to Nippon Electric Co., Inc. Integrally formed optical circuit with gradient refractive index. 3,922,062, Cl. 350-96.0WG.
Uchidoi, Masanori; and Shigeta, Yoshihiro, to Canon Kabushiki Kaisha. Equipment to synchronize pictures with sounds. 3,922,078, Cl. 353-15.000.
Uchidoi, Masanori; and Yamada, Tateo, to Canon Kabushiki Kaisha. Slide projection overlapping apparatus. 3,922,081, Cl. 353-86.000.
Uchisaka, Tsunehiko: *See—*
Yamada, Teruo; Yamada, Takeo; and Uchisaka, Tsunehiko, 3,922,037.
Uddemann Byggteknik AB: *See—*
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Udden, Per Edward Carl: *See—*
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Nabetani, Hiroshi; Ueda, Atsushi; Uota, Kosaku; and Ishii, Mitsuaki, 3,922,569.
Ueda, Fumio; and Arai, Hirotsugu, to Mitsubishi Denki Kabushiki Kaisha. Image or segment pattern forming X-Y matrix addressing method. 3,922,667, Cl. 340-324.00M.
Uemura, Masaru: *See—*
Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; and Saito, Mitsutaka, 3,922,473.
Uetsuki, Toshio, to Minolta Camera Kabushiki Kaisha. Multi-layer anti-reflection coating with high and low index material. 3,922,068, Cl. 350-164.000.
Ujiie, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of and apparatus for producing metallic articles by electroslag melting. 3,921,699, Cl. 164-52.000.
Ulbing, Otmar M., to Columbus McKinnon Corporation. Load balancer and hoist control. 3,921,959, Cl. 254-168.000.
Umezaki, Aitaka: *See—*
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Umezawa, Hamao; Nakayama, Yuya; Kunishima, Mamoru; and Matsubara, Midori, to Nippon Kayaku Kabushiki Kaisha. N-Substituted derivatives of bleomycins. 3,922,262, Cl. 260-112.500.
Umphrey, Ronald W., to Continental Oil Company. Turn guide apparatus with roller means. 3,921,534, Cl. 104-247.000.
Uncle Ben's of Australia Pty. Ltd.: *See—*
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Murphree, Francis J., 3,922,632.
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Uozaki, Seizo; and Sakashita, Hitoshi, to Aisin Seiki Kabushiki Kaisha. Thread-trimming device on a sewing machine. 3,921,554, Cl. 112-252.000.
Updegraff, Edward R. Method and apparatus for applying and removing contact lenses. 3,922,025, Cl. 294-1.0CA.
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Upton, Douglas J. Electric razor having an oscillating cutting head. 3,921,270, Cl. 30-43.300.

Urai, Muneharu, to Saito, Takeji. Seat mounting device for vehicle. 3,922,029, Cl. 296-65.00A.

Urayama, Kiyosi: *See—*
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Vaeth, Guenter: *See—*
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Vair, Gary G.: *See—*
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Valente, Raymond L., to Manco Mfg. Co. Machine tool for workpieces of extended dimension. 3,921,486, Cl. 83-420.000.

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Valles, Pedro: *See—*
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Valtchev, Alexander Jordanov; and Minov, Emil Pantaleev, to Metalurgitchen Zavod "Lenin". Method for producing protective coatings on carbon electrodes. 3,922,516, Cl. 219-76.000.

Van Cakenberghe, Jean L., to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for manufacturing thin layers of mineral substances. 3,922,214, Cl. 204-298.000.

Vandale, Leonard A.; and Obermeier, James A., to Goodyear Tire & Rubber Company, The. Tire ply stock edge alignment. 3,921,795, Cl. 198-256.000.

van den Bosch, Francois J. G. Monochromator and light dispersing apparatus. 3,922,092, Cl. 356-100.000.

van de Plassche, Rody Johan, to U.S. Philips Corporation. Amplifier circuit. 3,922,614, Cl. 330-30.00D.

Vanderbilt University: *See—*
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Vandewater, Lloyd L. Round bale handling attachment for a tractor. 3,921,837, Cl. 214-145.000.

Van Englehoven, Clarence: *See—*
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Van Moorsel, William H., to CF Industries, Inc. Method for treatment of urea crystallizer condensate. 3,922,222, Cl. 210-71.000.

Vann, Edwin L. Soft frozen all-natural fruit juice. 3,922,361, Cl. 426-599.000.

Vannest, Richard D.: *See—*
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Van Schoyck, Quentin H., to Cylpik, Incorporated. Method and apparatus for providing a sanitary elevated flooring system. 3,921,350, Cl. 52-180.000.

Varco International, Inc.: *See—*
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Varecka, Charles P.: *See—*
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Varian Associates: *See—*
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Vasaturo, Frank J.: *See—*
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Vasilos, Thomas: *See—*
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Vavra, Jaroslav: *See—*
Beranek, Jaroslav; Bazant, Vladimir, deceased; Bazantova, Vera, heir; Bazant, Petr, heir; Bazant, Ondrej, heir; Bazant, Jan, heir; Bazant, Vladimir, heir; Rossler, Robert; Dobrozemsky, Jaroslav; Fibinger, Vratislav; Dolansky, Josef; and Vavra, Jaroslav, 3,921,663.

VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
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Vegh, Elmer S.; and Schwerzler, David, to Alco Standard Corporation. Tray support assembly for use with tiltable kettles. 3,921,683, Cl. 141-270.000.

Velsicol Chemical Corporation: *See—*
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Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft: *See—*
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Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
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Vergobbi, Robert W., to Pneumatic Scale Corporation. Cork compressor mechanism. 3,921,370, Cl. 53-326.000.

Verkstadsteknik AB: *See—*
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Vermehren, Gunter: *See—*
Rosenkranz, Dieter; Bous, Karl; Schmidt, Roland; Engelhardt, Werner; and Vermehren, Gunter, 3,921,419.

Versnel, John; and Wolford, Lionel T., to Cities Service Oil Company. Preparation of a brominated fire retarding agent. 3,922,316, Cl. 260-648.00C.

Vertue, Charles R. Spray booth. 3,921,576, Cl. 118-634.000.

Vest, Eugene W.: *See—*
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Vibra-Metrics, Inc.: *See—*
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Vickers Limited: *See—*
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Victor Company of Japan, Limited: *See—*
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Victor Comptometer Corporation: *See—*
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Viegut, Cherie: *See—*
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Viegut, Dennis L.; and Viegut, Cherie. Electric hair curling iron. 3,922,521, Cl. 219-222.000.

Vieri, Bruno John, to Xerox Corporation. High power regulated D.C. supply. 3,922,595, Cl. 321-47.000.

Viking Industries, Inc.: *See—*
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Vilagi, Burton J.: *See—*
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Viney, Martin: *See—*
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Virginio Rimoldi & C. S.p.A.: *See—*
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Vischiani, Giuseppe: *See—*
Sarfati, Alberto Gustavo; and Vischiani, Giuseppe, 3,921,925.

Vit, Jaroslav. Chemically active decay attacking liquid administering apparatus and fatigue relieving connection therefor. 3,921,297, Cl. 32-40.00R.

Vock, Manfred: *See—*
Schreiber, William Lewis; Vock, Manfred; Hall, John B.; Shuster, Edward Joseph; and Quinn, Alton Dewitt, 3,922,237.

Vockenhuber, Karl: *See—*
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Vogel, Herman J., Jr., to Corning Glass Works. Closure device of plastic for tubes and containers. 3,921,845, Cl. 215-320.000.

Vogelman, Joseph H., to Orentreich Medical Group. Apparatus for recording heart rate rhythm. 3,921,624, Cl. 128-2.06F.

Vogelsberg, Dieter, to Siemens Aktiengesellschaft. Method of manufacturing a cable using SZ twisting devices. 3,921,381, Cl. 57-156.000.

Vollrath, Karl-Hans, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Suction device for separating and/or transporting sheets in a sheet-handling machine. 3,921,971, Cl. 271-103.000.

Volovinskaya, Valentina Pavlovna: *See—*
Gorbatov, Vasily Matveevich; Sinitsin, Konstantin Dmitrievich; Krylova, Nina Nikolaevna; Lyaskovskaya, Julia Nazarovna; Volovinskaya, Valentina Pavlovna; Bazarova, Klavdia Ivanovna; Solovieva, Ljudmila Ivanovna; and Khlamova, Rimma Igorevna, 3,922,367.

von der Linde, Dietrich: *See—*
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von der Lohe, Joachim; Gretz, Heinz; and Heitmann, Uwe, to Hauni-Werke Korber & Co. KG. Apparatus for determining the firmness of fillers in cigarette rods or the like. 3,921,644, Cl. 131-21.00B.

Vorozhtsov, Georgy Nikolaevich: *See—*
Dokunikhin, Nikolai Stepanovich; and Vorozhtsov, Georgy Nikolaevich, 3,922,142.

Voss, Alfred; Strunk, Manfred; Kroschel, Heinz; and Kreutz, Heinz Wilhelm, to Dynamit Nobel Aktiengesellschaft. Projectile or rocket preferably with unfolded tail unit. 3,921,937, Cl. 244-3.270.

Votroubek, Leland C.; and Nelsen, Duane H., to Iowa State University Research Foundation, Inc. Method and means of winding torsion spring. 3,921,761, Cl. 185-39.000.

VSI Corporation: *See—*
Stencel, Edgar L., 3,921,687.

Vyzkumny ustav bavlnarsky: *See—*
Pech, Josef; Kriz, Vladimir; and Nespesny, Zbynek, 3,921,676.

W. Schlafhorst & Co.: *See—*
Apken, Rainer, 3,921,418.
Gith, Walter, 3,921,877.

Waaske, Heinz, to Rollei-Werke Franke & Heidecke. Diaphragm shutter for photographic cameras. 3,922,697, Cl. 354-228.000.

Wadsworth, Carl D. Digital communication system which can be utilized as a security system for apartment houses or the like. 3,922,664, Cl. 340-276.000.

Wagner, Hans; and Udluft, Klaus, to Deutsche Gold- und Silber-Scheideanstalt vormals Roesaler. Process for the production of 3-chloropropanol-1. 3,922,313, Cl. 260-633.000.

Wakefield, Robert H., Jr.: *See—*
Cunningham, James A.; Wakefield, Robert H., Jr.; and Guidry, Mark R., Jr., 3,921,282.

Waldman Corporation: *See—*
Bryceland, Maurice Cyril, 3,922,509.

Walker, Andrew M.: *See*—
Gabbard, Ova Gene; Husted, John M.; Kaul, Pradman P.; Werth, Andrew M.; and Walker, Andrew M., 3,922,496.

Walker, Brooks. Exhaust gas recirculation control by exhaust flow. 3,921,611, Cl. 123-119.00A.

Wallace Murray Corporation: *See*—
Benisek, Edward F., 3,922,108.

Walles, Wilhelm E., to Dow Chemical Company, The. Heat insulating container having plastic walls retaining vacuum. 3,921,844, Cl. 215-13.00R.

Wallmark, John Torkel; and Bakowski, Mieczyslaw, to Allmanna Svenska Elektriska Aktiebolaget. Semiconducting element having improved voltage endurance properties. 3,922,709, Cl. 357-53.000.

Wallshein, Melvin. Orthodontic biassing device. 3,921,294, Cl. 32-14.00E.

Walon, Raoul Guillaume Philippe; and Berghmans, Elie Francois, to CPC International Inc. Enzymatic hydrolysis of granular starch. 3,922,200, Cl. 195-31.00R.

Walse, Alan S.; and Reed, Donald J., to Akzona Inc. Explosion-proof electrical cable reel connector. 3,921,769, Cl. 191-12.00R.

Walser, Hans, to Gulf Oil Canada Limited. Method of improving heat stability of emulsion polymerized polyvinyl chloride. 3,922,258, Cl. 260-92.80W.

Walt Disney Productions: *See*—
Artzer, Richard F., 3,921,980.

Walter Kidde & Company, Inc.: *See*—
Spain, Stanley R., 3,921,819.

Walters, Russell W., to BMR Security Products Corporation. Locking bar system. 3,921,422, Cl. 70-97.000.

Walters, Tom. Hose coupling. 3,922,011, Cl. 285-277.000.

Walworth, Bryant Leonidas; and Klingsberg, Erwin, to American Cyanamid Company. Novel herbicidal compositions. 3,922,161, Cl. 71-92.000.

Wamser, Anton: *See*—
Grof, Helmut Theodor; Sonntag, Heinrich Fritz; Scheidig, Helmut; and Wamser, Anton, 3,921,698.

Wankier, Bartley N.: *See*—
Glicksman, Martin; and Wankier, Bartley N., 3,922,369.

Wanless, Gordon James, to British Petroleum Company Limited, The. Hydrocarbon separation process. 3,922,218, Cl. 208-310.000.

Ward, David M., to Potter Electric Signal Co. Non-binding shaft seal assembly for liquid flow detectors. 3,921,989, Cl. 277-173.000.

Ward, Harry M., III, to Outboard Marine Corporation. Method of die-casting a combined sheave and flywheel assembly. 3,921,702, Cl. 164-112.000.

Warner, Henry L., to United States of America, Navy. Sonar system. 3,922,634, Cl. 340-6.00R.

Warner-Lambert Company: *See*—
Turner, James E.; and Kenoff, Michael B., 3,922,145.

Warren, Anthony Charles; and Nicholls, Bryan Frederick, to Mettoy Company Limited, The. Electrical systems and apparatus. 3,922,590, Cl. 318-138.000.

Warren, John E. C. Game bat. 3,921,978, Cl. 273-67.00R.

Warren, Loring Ferdinand; and Chappius, William George. Floor buffer. 3,921,244, Cl. 15-98.000.

Washio, Takaji: *See*—
Kitagawa, Takaich; Miyoshi, Yoshitaka; Washio, Takaji; and Aizawa, Tatsuo, 3,921,973.

Watanabe, Hiroyuki: *See*—
Suzuki, Ichiro; and Watanabe, Hiroyuki, 3,921,747.

Watanabe, Noritoshi: *See*—
Masaoka, Takashi; Watanabe, Noritoshi; Takegawa, Yasuo; and Kitahori, Tojiro, 3,922,463.

Watanabe, Tetsuo: *See*—
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Watanabe, Tokuji: *See*—
Hashizume, Kazumoto; and Watanabe, Tokuji, 3,922,359.

Watanabe, Yuji: *See*—
Kondo, Katsumi; Noda, Fumiyoshi; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, 3,921,273.

Watford Engineering Limited: *See*—
Burns, Michael P. H., 3,921,512.

Watson, Tandy P.: *See*—
Hickey, Richard C.; Bond, John H.; and Watson, Tandy P., 3,921,969.

Watt, William E. R.: *See*—
Christine, William C.; and Watt, William E. R., 3,922,099.

Watts, Roy Herbert: *See*—
Saunders, Leslie Sargeant, 3,921,595.

Wawracz, Joyce L. Pill dispenser. 3,921,806, Cl. 206-534.000.

Weatherston, Roger C., to Calspan Corporation. Two-stage roots type compressor. 3,922,117, Cl. 418-9.000.

Weaver, Michael James Douglas: *See*—
Restall, James Edward; and Weaver, Michael James Douglas, 3,922,168.

Webber, J. Alan: *See*—
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Weber, Friedrich: *See*—
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Weber, Hans: *See*—
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Weber, Heinz, to Telesco Brophey Limited. Umbrella frame. 3,921,655, Cl. 135-20.00R.

Weber, Reinhart: *See*—
Connelly, Edward B.; and Weber, Reinhart, 3,921,354.

Weekers, Theodorus Hendrikus, to U.S. Philips Corporation. Method of coating a chromium-nickel component with a chromium oxide-containing layer, and component having such a layer. 3,922,179, Cl. 148-6.300.

Wegwerth, Arthur A.; and Lowrey, R. Dean, to Minnesota Mining and Manufacturing Company. Safety glass light control medium. 3,922,440, Cl. 428-437.000.

Weihe, Clyde R., Jr., to Adamation, Inc. Pot-washing machine. 3,921,651, Cl. 134-57.0DL.

Weil-McLain Company, Inc.: *See*—
Deters, Elmer M., 3,922,111.

Weiner, Maurice, to United States of America, Army. Electron bombarded semiconductor. 3,922,616, Cl. 330-44.000.

Weinstein, Martin: *See*—
Speirs, Kenneth K.; Weinstein, Martin; and Dean, Michael F., 3,922,396.

Weiss, Jurgen: *See*—
Murawski, Kurt; Hagen, Rolf; Heitzig, Claus-Peter; and Weiss, Jurgen, 3,922,056.

Weisskopf, Ernst, to Firm of Georg Merkel, successor to Johann Hawner, KG, The. Convertible sign. 3,921,321, Cl. 40-33.000.

Welch, Irene P. Jar cap dispenser. 3,921,863, Cl. 222-370.000.

Welch, John A.; and Mitchell, Robert W., to General Tire & Rubber Company, The. Composite impact absorbing safety structure. 3,922,429, Cl. 428-315.000.

Welkowsky, Murray S.: *See*—
Proudian, Andrew P.; Welkowsky, Murray S.; and Wright, Steven A., 3,922,547.

Wells, William Eugene, Sr., to United States of America, Navy. Active torpedo decoy and sonar target. 3,921,559, Cl. 114-20.000.

Wendl, Erwin: *See*—
Haller, Hans; and Wendl, Erwin, 3,922,135.

Wener, Hyman. Safety vehicle seat structure. 3,922,035, Cl. 297-250.000.

Wennerblow, Bengt Axel: *See*—
Lindgren, John Ivar; Udden, Per Edward Carl; and Wennerblow, Bengt Axel, 3,922,434.

Wenther, Joseph F.: *See*—
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Wernick, Jack Harry: *See*—
Bachmann, Klaus Jurgen; Buehler, Ernest; Shay, Joseph Leo; and Wernick, Jack Harry, 3,922,553.

Werth, Andrew M.: *See*—
Gabbard, Ova Gene; Husted, John M.; Kaul, Pradman P.; Werth, Andrew M.; and Walker, Andrew M., 3,922,496.

West, Edward L.: *See*—
Clutter, Melvin E.; and West, Edward L., 3,922,476.

Westbrock, Adrian J., to American Standard, Inc. Turbulator. 3,921,711, Cl. 165-109.000.

Westerlund, Tage, to Linden-Alimak AB. Motor driven hoist device for simultaneous lifting of a cage gate and a gate at a stopping level. 3,921,763, Cl. 187-52.0LC.

Western Electric Company, Inc.: *See*—
Blevins, Terrence L., 3,922,052.

Western Geophysical Company of America: *See*—
Thigpen, Ben B., 3,921,755.

Western Power Products, Inc.: *See*—
Coon, James D., 3,921,949.

Westinghouse Brake & Signal Co. Ltd.: *See*—
Norton, David John; and Corrie, John Douglas, 3,921,946.

Westland Aircraft Limited: *See*—
Jupe, Robert John; and Joiner, Walter Charles, 3,921,938.

Wetzel, Rodney J., to Hydraulic Workover, Inc. Hydraulic packer apparatus and method. 3,921,720, Cl. 166-315.000.

Wheeler, James E., to Bethlehem Steel Corporation. Method for retaining material within a plunging bell. 3,921,838, Cl. 214-152.000.

Wheeler, Robert Charles, to GTE Sylvania Incorporated. Unidirectional color enhancement circuit. 3,922,713, Cl. 358-37.000.

Whirlpool Corporation: *See*—
Christianson, Robert W.; and Elsner, Else, 3,922,048.
Kretchman, Gerald L.; and Ohmann, William, 3,921,421.

White, Arthur N. Distributing terminal assembly test apparatus. 3,922,507, Cl. 179-175.30R.

White, Lyle E.: *See*—
Bottum, Charles F., 3,921,759.

White, Philip C.: *See*—
Fishaber, Marvin H.; and White, Philip C., 3,922,229.

White-Westinghouse Corporation: *See*—
Grimes, Stephen L.; and Rainey, jerry M., 3,921,903.

Whitehead, Richard K., Sr. Bobbin holder with internal brake. 3,921,932, Cl. 242-130.200.

Whiteley, Eric, to General Electric Company. Permanent magnet hermetic synchronous motor. 3,922,574, Cl. 310-156.000.

Whitney, Ronald L.: *See*—
Burton, John S.; and Whitney, Ronald L., 3,922,084.

Whitney, Walter D. Apparatus for straightening automobile frames and the like. 3,921,433, Cl. 72-461.000.

Whittaker Corporation: *See*—
Curry, Renwick E.; and Sheena, David, 3,922,665.

Whittle, Kenneth Frederick, to Protein Foods (U.K.) Limited. Heat-processed dehydrated bacteriologically-stable pork rind product and process for preparing same. 3,922,377, Cl. 426-645.000.

Whitworth, Clyde Jesse, Jr.: *See—*
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Whyte, David Denzil, to Procter & Gamble Company, The. Self-inflating structure. 3,921,232, Cl. 5-91.000.
Wick, Alexander E.: *See—*
Leimgruber, Willy; and Wick, Alexander E., 3,922,285.
Wiedmann, Siegfried K.: *See—*
Berger, Horst H.; and Wiedmann, Siegfried K., 3,922,565.
Wiesinger, Horst; and Holleis, Gunter, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Starter bar for use in continuous casting plants. 3,921,706, Cl. 164-274.000.
Wildhaber, Ernest, to Bird Island, Inc. Inch-metric dial. 3,921,566, Cl. 116-115.500.
Wildhaber, Ernest; and Chapman, Howard G., to Bird Island, Inc. Inch-metric dial. 3,921,567, Cl. 116-115.500.
Wilfert, Karl, to Daimler-Benz Aktiengesellschaft. Passenger motor vehicle. 3,922,033, Cl. 296-146.000.
Wilkerson, Edward D. Brake pedal caliper. 3,921,302, Cl. 33-169.00R.
Wilkinson, Frank: *See—*
Corliss, Robert F.; and Wilkinson, Frank, 3,921,667.
Wilks, Alan D.; and Youtsey, Karl J., to Universal Oil Products Company. Polymeric laminates. 3,922,383, Cl. 427-82.000.
Willett, Norman F. Precision leaf sampling device. 3,921,459, Cl. 73-425.200.
William Pyrm-Werke KG: *See—*
Glindmeyer, Friedrich; Hennenberg, Wilhelm Friedrich; and Limpens, Karl, 3,921,679.
Williams, Frank J., III: *See—*
Heath, Darrell R.; and Williams, Frank J., III, 3,922,284.
Williams, Kevin G., to United States of America, Navy. Detection of CO_2 in a hyperbaric gaseous environment. 3,922,551, Cl. 250-343.000.
Williams, Neal M.: *See—*
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Willis, Chester R.: *See—*
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Willmann, Erich; and Muller, Reinhard, to Simplex Time Recorder Co. Flexitime recorder. 3,922,531, Cl. 235-92.00T.
Wilmsmeyer, Klaus: *See—*
Adam, Fritz G.; Obermeier, Cornelius; Scheffer, Gerhard; and Wilmsmeyer, Klaus, 3,922,567.
Wilson, Donald James: *See—*
Kenyon, Derek; and Wilson, Donald James, 3,921,691.
Wilson, Gerald M.; and Ferreri, John G., to Spartan Mills, Inc. Surgical drape with drainage troughs. 3,921,627, Cl. 128-132.00D.
Wilson, Michael C., to Plus Four, Inc. Devices with slide-action-articulated gripping and/or cutting members. 3,921,477, Cl. 81-128.000.
Wilson, Raymond F.; Estes, John H.; and Kravitz, Stanley, to Texaco Inc. Production of light ends. 3,922,216, Cl. 208-73.000.
Wilson, Robert F., to GTE Sylvania Incorporated. Large area cathode. 3,922,578, Cl. 313-278.000.
Winger, Jerrold, to Union Carbide Corporation. Alkaline battery seal and protective coating comprising a fatty acidamide. 3,922,178, Cl. 136-133.000.
Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. (1-Alkyl-5-nitro-imidazolyl-2-alkyl)-pyridyl compounds. 3,922,277, Cl. 260-294.80F.
Winn-Boughton Limited: *See—*
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Winslow, Louis E.: *See—*
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Winter, Lloyd C. Clubhead having alignment means and high moment of inertia spaced from center of gravity thereof. 3,921,984, Cl. 273-164.000.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., to Firmenich & Cie. Flavoring agent. 3,922,366, Cl. 426-535.000.
Wirges, Winfried, to Stabilus GmbH. Telescoping column assembly. 3,921,952, Cl. 248-404.000.
Wirotana, I. Poetoe Gde: *See—*
Ney, Karl Heinz; Wirotana, I. Poetoe Gde; and Freytag, Wolfram Gustav, 3,922,365.
Wirz, Armin, to Rieter Machine Works, Ltd. Drawroll arrangement. 3,921,431, Cl. 72-289.000.
Wisconsin Alumni Research Foundation: *See—*
Schroeder, Collin H.; Lechnir, Richard J.; and Derse, Philip H., 3,922,291.
Wise, Richard M., to General Tire & Rubber Company, The. Polyester bonded to rubber and method for making the same. 3,922,422, Cl. 428-246.000.
With, Bror. Ski binding with clamping bail. 3,921,996, Cl. 280-11.35B.
Witkin, Donald E.; and Bowles, Arnold G., to National Forge Company. Temperature control apparatus. 3,922,527, Cl. 219-494.000.
Witt, Edgar C.; and Daniele, Donald T., to Diamond International Corporation. Apparatus for molding articles with multiple basis weight or thickness. 3,922,191, Cl. 162-383.000.
Wittmaack, Klaus: *See—*
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Wittman, Eric W.: *See—*
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Wodick, Reinhard: *See—*
Lubbers, Dietrich W.; and Wodick, Reinhard, 3,922,088.
Woehrle, Richard E., to M & T Chemicals Inc. Lubricating coating for metal sheet. 3,922,183, Cl. 148-31.500.
Wolff, Peter A., to Massachusetts Institute of Technology. Two frequency stimulated spin flip. 3,922,560, Cl. 307-88.300.
Wolford, Lionel T.: *See—*
Versnel, John; and Wolford, Lionel T., 3,922,316.
Wood, Loren E.; and Reynolds, John W., to Black, Sivalls & Bryson, Inc. Scored reverse buckling rupture disk manufacturing method. 3,921,556, Cl. 113-120.00R.
Woodhams, Ronald Alfred, to Ministry of Aviation. Moving target detection radar system. 3,922,675, Cl. 343-7.700.
Woodilla, John E., Jr.; Hunt, Gordon W.; and Green, Willard B., Jr., to Torrington Company, The. Thermal treatment of steel. 3,922,181, Cl. 148-15.000.
Woodman Company, Inc., The: *See—*
Henry, Nelson R., 3,921,928.
Woodman, David Edward, to Resource Planning Associates, Inc. Atomization of liquid fuels. 3,921,901, Cl. 239-13.000.
Woofter, Robert C.; and Pearce, Warren, Jr., to General Motors Corporation. Electrical connection of conductor leads and method of making same. 3,922,480, Cl. 174-72.00R.
Wright, Hubert Charles, to Plessey Handel und Investments A.G. Radio antennae encased in dielectric to reduce size. 3,922,684, Cl. 343-831.000.
Wright, Joseph D. Chain guide for use in a heat treating oven or the like and method of manufacture. 3,921,468, Cl. 74-240.000.
Wright, Robert J., to Research Laboratories of Australia Pty. Limited. Means for rapid development of electrostatic images. 3,921,579, Cl. 118-637.000.
Wright, Steven A.: *See—*
Proudian, Andrew P.; Welkowsky, Murray S.; and Wright, Steven A., 3,922,547.
Wullenweber, Paul: *See—*
Radmacher, Edmund; and Wullenweber, Paul, 3,922,431.
Wunsch, Richard, to McKee, Samuel. Cylinder construction. 3,921,505, Cl. 92-169.000.
Wust, Olivier, to Rieter Machine Works, Ltd. Method of automatically changing winding tubes and winding apparatus for implementing the aforesaid method and improved spool doffing mechanism. 3,921,922, Cl. 242-18.00A.
Wyczalek, Floyd A., to General Motors Corporation. Plasma jet ignition engine and method. 3,921,605, Cl. 123-143.00B.
Wyhof, John R.: *See—*
Kuehn, Erich; and Wyhof, John R., 3,922,448.
Wynn, John D.: *See—*
Bell, Richard J.; Wynn, John D.; Denton, George T.; Sand, Ralph E.; and Cornelius, David L., Jr., 3,922,374.
Wyslouch, Zenon; and Brachmanski, Eugeniusz, to Fabryka Maszyn Budowlanych "Fadroma". Articulated hydraulic travelling loader. 3,921,836, Cl. 214-142.000.
Wysong, Ronald E., to R. L. Drake Company. Radio broadcasting system. 3,922,607, Cl. 325-48.000.
Xerox Corporation: *See—*
Bergfjord, John Alf; Grammatica, Steven James; and Radler, Richard William, 3,922,169.
Howard, Willard L.; and Tietjen, Thomas A., 3,921,577.
Ishimura, Mamoru, 3,921,896.
Kanitz, Bruce R., 3,922,611.
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Yaegashi, Mamoru: *See—*
Kodama, Akira; Yaegashi, Mamoru; and Nishida, Shoichi, 3,922,080.
Yagiela, Frank D., to General Motors Corporation. Gear inspection tool. 3,921,304, Cl. 33-179.50C.
Yahagi, Masakichi; and Horiuchi, Shoichi, to Shin Nisso Kako Co., Ltd. New fluoran compound. 3,922,283, Cl. 260-325.000.
Yamada, Akiharu: *See—*
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Yamada, Tateo: *See—*
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Yamada, Teruo; Yamada, Takeo; and Uchisaka, Tsunehiko. Rotary member holding assembly. 3,922,037, Cl. 308-6.00B.
Yamada, Yasuo: *See—*
Katayama, Shigeo; Sato, Katsunori; Miyagawa, Tomoyuki; Takahashi, Hisateru; Kato, Takashi; Yoshizawa, Toshio; and Yamada, Yasuo, 3,921,921.
Yamagishi, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Crane suspension control apparatus. 3,921,818, Cl. 212-132.000.
Yamaki, Hideo: *See—*
Yusa, Hideo; Kamiya, Kunio; Murata, Toshifumi; Yamaki, Hideo; and Hisatomi, Shigenobu, 3,922,150.

Yamaki, Michihiro. Diaphragm mechanism for single lens reflex camera adapted to facilitate substitution of interchangeable lenses. 3,922,699, Cl. 354-270.000.

Yamamoto, Aijiro: *See—*
Mitsuda, Hisateru; Kawai, Fumio; Kuga, Mutsuo; Saito, Fumitaka; and Yamamoto, Aijiro, 3,922,363.

Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, to Sumitomo Chemical Company, Limited. Production of benzodiazepine derivatives. 3,922,264, Cl. 260-239.30D.

Yamamoto, Hisao: *See—*
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,922,266.

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Yamamuro, Isao, to Pioneer Electronic Corporation. Moving voice coil electro-acoustic converter with laminated magnetically anisotropic poles. 3,922,501, Cl. 179-115.50R.

Yamashita, Shigeji: *See—*
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Yamauchi, Toshiro: *See—*
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Yamura, Akira: *See—*
Onoda, Takeru; Yamura, Akira; Ohno, Akihisa; Haji, Junzo; Toriya, Jun; Sata, Masato; and Ishizaki, Naoatsu, 3,922,300.

Yamura Kabushikikaisha Shinko Seisakusho: *See—*
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Yanagida, Syoji: *See—*
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Yasui, Shoji: *See—*
Okada, Hiroshi; Horibe, Hiroshi; Mizuno, Yasushi; Yasui, Shoji; Ikegaya, Kazuo; and Suzumura, Nobuo, 3,921,623.

Yasumoto, Takaya: *See—*
Oshima, Keisuke; Yasumoto, Takaya; Higashikuze, Michiaki; and Kawamoto, Masanari, 3,922,414.

Yata, Kotaro; Nanba, Yasuhiro; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Exposure time control device for use in single lens reflex camera. 3,922,692, Cl. 354-51.000.

Yates, Robert W., to Redken Laboratories, Inc. Apparatus for measuring tensile properties of hair. 3,921,443, Cl. 73-95.000.

Yavitch, Morris. Water closet ring. 3,921,229, Cl. 4-252.00R.

Yerman, Alexander J., to General Electric Company. Dielectrically isolated integral silicon diaphram or other semiconductor product. 3,922,705, Cl. 357-26.000.

Ygfors, Goran, to Ygfors Trading AB. Tool, such as a pair of pliers or scissors. 3,921,478, Cl. 81-417.000.

Ygfors Trading AB: *See—*
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Ygnis S.A.: *See—*
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Yokoi, Masatada, to Aisin Seiki Kabushiki Kaisha. Wheel cylinder in a dual hydraulic brake system of a vehicle. 3,921,767, Cl. 188-345.000.

Yokota, Minoru: *See—*
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Yoshihara, Tetsuya; Sawada, Hajime; and Watanabe, Tetsuo, to Nippon Kokan Kabushiki Kaisha; Kokankikai Kogyo Kabushiki Kaisha; and Tokyo Yogyo Kabushiki Kaisha. Assembling apparatus for sliding nozzle mounted on the bottom of a ladle. 3,921,274, Cl. 29-200.00R.

Yoshikawa, Kazuo: *See—*
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Yoshikawa, Takayuki; Hisada, Eiichi; and Hujii, Tooru, to Nippon Toki Kabushiki Kaisha (Noritake Co. Ltd.). Thin-walled carbonaceous honeycomb structures. 3,922,412, Cl. 428-118.000.

Yoshimura, Tooru: *See—*
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Yoshioka, Hirosuke; Higo, Akio; Hirai, Hajime; and Itaya, Nobushige, to Sumitomo Chemical Company, Limited. Process for the production of optically active dihydrochrysanthemolactone. 3,922,286, Cl. 260-343.200.

Yoshizawa, Kosaku: *See—*
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Yoshizawa, Toshio: *See—*
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Yuki, Kazuo: *See—*
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Yusa, Haruhiko; and Ochiai, Yukihiro, to Kureha Kagaku Kogyo K.K. Methyl Methacrylate resins and grafted acrylate-butadiene-styrene polymers. 3,922,321, Cl. 260-876.00R.

Yusa, Hideo; Kamiya, Kunio; Murata, Toshifumi; Yamaki, Hideo; and Hisatomi, Shigenobu, to Hitachi, Ltd.; and Power Reactor and Nuclear Fuel Development Corporation. Process and apparatus for separating and recovering krypton-85 from exhaust gas of nuclear reactor or the like. 3,922,150, Cl. 55-25.000.

Zackheim, Eli A., to Silver, Jules. Liquid dispensing cup for flexible container. 3,921,860, Cl. 222-207.000.

Zaffaroni, Alejandro, to Alza Corporation. Novel drug delivery device. 3,921,636, Cl. 128-260.000.

Zaidan Hojin Kikai Shinko Kyokai: *See—*
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Zaidanhojin Nippon Shikisai Kenkyusho: *See—*
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Zakharov, Ivan Dmitrievich: *See—*
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Zangenfeind, Helmut, to Agfa-Gevaert Aktiengesellschaft. Apparatus for removing exposed films and backing strips from cassettes. 3,921,878, Cl. 226-91.000.

Zanier, Aldo M.: *See—*
Reynolds, Edward B.; Pert, Donald M.; and Zanier, Aldo M., 3,921,732.

Zappia, Anthony T., to Ball Brothers Service Corporation. Plug gauge. 3,921,303, Cl. 33-178.00R.

Zeamer, Aaron C., to SCM Corporation. Typebar assembly. 3,921,783, Cl. 197-36.000.

Zellmann, Karl: *See—*
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Zenith Radio Corporation: *See—*
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Zentra Albert Burkle Kommanditgesellschaft: *See—*
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Zepernick, Gunther Paul: *See—*
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Ziche, Arrigo, to Brevetti C.E.A. S.p.A. Box for containing vials or the like adapted for automatic loading. 3,921,895, Cl. 229-39.00B.

Zigman, Alvin R.: *See—*
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Zimmer, Peter. Rotary printing machine. 3,921,519, Cl. 101-116.000.

Zimmer, Peter. Ink applicator for screen printer. 3,921,520, Cl. 101-120.000.

Zimmer, Peter. Device for the printing of long repeat distance designs. 3,921,522, Cl. 101-129.000.

Zimmer, Peter: *See—*
Kudlich, Hans, 3,921,521.

Zimmer, Raymond. Mill for producing meslins and flours. 3,921,919, Cl. 241-56.000.

Zimmerer, Arthur L., to Lindsay Manufacturing Company. Corner irrigation machine. 3,921,908, Cl. 239-177.000.

Zimmermann, Erich: *See—*
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Zimmermann, Joseph J., to GTE Automatic Electric Laboratories Incorporated. Spiral disc recorder using a single motor for turntable and head drive. 3,922,717, Cl. 360-75.000.

Zoephel, Richard L., to Kendall Company, The. Hospital gown having fitting means. 3,921,221, Cl. 2-51.000.

Zollner, Wolfgang, to Henkel & Cie GmbH. Process for applying liquid freshening agents to textile threads. 3,922,144, Cl. 8-151.200.

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JANUARY 28, 1975 NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 328,200	3,916,031	Oct. 28, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 328,205	3,914,106	Oct. 21, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 328,210	3,914,275	Oct. 21, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 328,870	3,916,486	Nov. 4, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 329,476	3,920,562	Nov. 18, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 329,787	3,920,688	Nov. 18, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 330,828	3,913,589	Oct. 21, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 331,417	3,914,157	Oct. 21, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 331,557	3,916,577	Nov. 4, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 331,895	3,916,403	Oct. 28, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 333,876	3,921,208	Nov. 18, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 334,868	3,919,469	Nov. 11, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 335,773	3,920,953	Nov. 18, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 336,652	3,914,211	Oct. 21, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 336,902	3,918,897	Nov. 11, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 336,946	3,919,425	Nov. 11, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 337,235	3,919,386	Nov. 11, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 337,442	3,913,658	Oct. 21, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 337,703	3,914,690	Oct. 21, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 340,212	3,922,645	Nov. 25, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 341,579	3,913,363	Oct. 21, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 343,136	3,919,453	Nov. 11, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 343,506	3,916,021	Oct. 28, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 343,577	3,921,165	Nov. 18, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 345,060	3,916,018	Oct. 28, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 345,384	3,916,146	Oct. 28, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 345,422	3,914,392	Oct. 21, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 345,567	3,913,985	Oct. 21, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 346,165	3,913,293	Oct. 21, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 288,627	3,916,179	Oct. 28, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 289,471	3,917,184	Nov. 4, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 289,523	3,921,166	Nov. 18, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 292,054	3,915,877	Oct. 28, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 292,126	3,914,465	Oct. 21, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 292,140	3,914,340	Oct. 21, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 293,437	3,913,414	Oct. 21, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 294,579	3,916,737	Nov. 4, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 294,673	3,916,023	Oct. 28, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 295,481	3,921,593	Nov. 25, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 295,674	3,916,107	Oct. 28, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 299,267	3,917,106	Nov. 4, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 300,353	3,921,734	Nov. 25, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 303,702	3,914,131	Oct. 21, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 305,417	3,915,882	Oct. 28, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 305,868	3,921,463	Nov. 25, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 306,938	3,916,050	Oct. 28, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 307,677	3,915,276	Oct. 28, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 308,892	3,919,624	Nov. 11, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 309,207	3,914,743	Oct. 21, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 309,499	3,922,002	Nov. 25, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 309,755	3,919,468	Nov. 11, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 309,756	3,914,136	Oct. 21, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 309,860	3,922,485	Nov. 25, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 311,317	3,918,975	Nov. 11, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 313,900	3,915,932	Oct. 28, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 314,049	3,920,588	Nov. 18, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 314,271	3,921,845	Nov. 25, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 315,363	3,920,673	Nov. 18, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 315,731	3,914,108	Oct. 21, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 316,014	3,920,861	Nov. 18, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 316,239	3,913,546	Oct. 21, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 318,195	3,915,699	Oct. 28, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 318,618	3,915,365	Oct. 28, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 318,745	3,916,571	Nov. 4, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 319,339	3,916,056	Oct. 28, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 319,402	3,919,568	Nov. 11, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 320,603	3,915,571	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 321,018	3,921,623	Nov. 25, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 363,457	3,922,595	Nov. 25, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 363,892	3,913,395	Oct. 21, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 363,962	3,921,826	Nov. 25, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 364,022	3,913,499	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 364,163	3,916,092	Oct. 28, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 364,241	3,916,668	Nov. 4, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 364,528	3,919,510	Nov. 11, 1975
B 364,786	3,921,673	Nov. 25, 1975
B 365,490	3,918,527	Nov. 11, 1975
B 365,834	3,914,702	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975
B 366,589	3,914,719	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975
B 367,661	3,914,158	Oct. 21, 1975
B 368,392	3,913,812	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975
B 369,997	3,913,533	Oct. 21, 1975
B 371,787	3,921,217	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975
B 373,326	3,920,433	Nov. 18, 1975
B 373,428	3,915,511	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975
B 375,652	3,921,303	Nov. 25, 1975
B 376,504	3,914,570	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975
B 376,799	3,913,955	Oct. 21, 1975
B 377,172	3,918,255	Nov. 11, 1975
B 377,833	3,913,884	Oct. 21, 1975
B 377,869	3,917,002	Nov. 4, 1975
B 379,172	3,914,379	Oct. 21, 1975
B 379,282	3,913,462	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1075
B 380,310	3,921,048	Nov. 18, 1975
B 380,312	3,913,953	Oct. 21, 1975
B 380,900	3,913,307	Oct. 21, 1975
B 381,074	3,919,583	Nov. 11, 1975
B 381,632	3,914,732	Oct. 21, 1975
B 381,847	3,921,152	Nov. 18, 1975
B 382,021	3,913,212	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975
B 382,783	3,919,527	Nov. 11, 1975
B 382,840	3,922,007	Nov. 25, 1975
B 383,532	3,914,246	Oct. 21, 1975
B 384,658	3,913,452	Oct. 21, 1975
B 384,773	3,915,416	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975
B 387,687	3,918,151	Nov. 11, 1975
B 387,761	3,914,245	Oct. 21, 1975
B 387,818	3,918,935	Nov. 11, 1975
B 389,070	3,914,171	Oct. 21, 1975
B 389,285	3,914,631	Oct. 21, 1975
B 389,639	3,914,626	Oct. 21, 1975
B 389,726	3,921,010	Nov. 18, 1975
B 389,807	3,922,623	Nov. 25, 1975
B 389,932	3,913,268	Oct. 21, 1975
B 389,933	3,913,267	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975
B 390,732	3,913,878	Oct. 21, 1975
B 391,184	3,914,214	Oct. 21, 1975
B 391,210	3,914,220	Oct. 21, 1975
B 391,437	3,915,416	Oct. 28, 1975
B 391,675	3,916,017	Oct. 28, 1975
B 392,696	3,916,175	Oct. 28, 1975
B 392,732	3,914,903	Oct. 21, 1975
B 392,753	3,916,341	Oct. 28, 1975
B 392,894	3,914,763	Oct. 21, 1975
B 393,163	3,914,535	Oct. 21, 1975
B 393,970	3,914,638	Oct. 21, 1975
B 394,088	3,914,740	Oct. 21, 1975
B 394,300	3,914,159	Oct. 21, 1975
B 394,712	3,916,306	Oct. 28, 1975
B 395,478	3,922,577	Nov. 25, 1975
B 395,496	3,919,435	Nov. 11, 1975
B 395,671	3,920,418	Nov. 18, 1975
B 395,889	3,913,190	Oct. 21, 1975
B 396,025	3,913,869	Oct. 21, 1975
B 396,551	3,921,929	Nov. 25, 1975
B 397,527	3,913,488	Oct. 21, 1975
B 397,990	3,914,848	Oct. 28, 1975
B 398,262	3,913,481	Oct. 21, 1975
B 398,597	3,913,743	Oct. 21, 1975
B 398,625	3,920,996	Nov. 18, 1975
B 399,292	3,914,810	Oct. 28, 1975
B 399,304	3,919,567	Nov. 11, 1975
B 399,766	3,915,667	Oct. 28, 1975
B 400,310	3,915,507	Oct. 28, 1975
B 402,555	3,914,688	Oct. 21, 1975
B 403,140	3,913,486	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975
B 403,990	3,914,684	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28, 1975
B 404,437	3,915,200	Oct. 28, 1975
B 405,136	3,915,565	Oct. 28, 1975
B 405,137	3,915,566	Oct. 28, 1975
B 405,305	3,922,111	Nov. 25, 1975
B 405,360	3,913,403	Oct. 21, 1975
B 405,938	3,920,109	Nov. 18, 1975
B 406,065	3,914,199	Oct. 21, 1975
B 408,749	3,914,116	Oct. 21, 1975
B 409,220	3,915,648	Oct. 28, 1975
B 409,251	3,922,620	Nov. 25, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Nov. 11, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF NOVEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allied Chemical Corporation: *See—*
Lewis, Donald J.; and Bishop, Robert J., Re. 28,624.

Analog Devices, Incorporated: *See—*
Pastoriza, James J., Re. 28,633.

Badger, Joe G., to Sarkes Tarzian, Inc. Television Tuner. Re. 28,632, Cl. 334-51.000.

Bishop, Robert J.: *See—*
Lewis, Donald J.; and Bishop, Robert J., Re. 28,624.

Brudi Equipment, Inc.: *See—*
Brudi, Ronald A., Re. 28,623.

Brudi, Ronald A., to Brudi Equipment, Inc. Push-pull attachment for lift trucks. Re. 28,623, Cl. 214-514.000.

Burke, John F.: *See—*
Scudder, Kenneth R.; Burke, John F.; and Dunn, John L., Re. 28,622.

Carlson, Dana Peter; and West, Norman Eugene, to Du Pont de Nemours, E. I., and Company. Radiation treated poly(ethylene/chlorotrifluoroethylene) and poly(ethylene/tetrafluoroethylene) having improved high temperature properties. Re. 28,628, Cl. 204-159.200.

Clausen, Victor H.; and Zweig, Arnold, to Stetson Ross, Inc. Wood veneer and joining and handling apparatus. Re. 28,627, Cl. 156-433.000.

Cunningham, Robert A., to Hughes Tool Company. Rock drill with increased bearing life. Re. 28,625, Cl. 308-8.200.

Dunn, John L.: *See—*
Scudder, Kenneth R.; Burke, John F.; and Dunn, John L., Re. 28,622.

Du Pont de Nemours, E. I., and Company: *See—*
Carlson, Dana Peter; and West, Norman Eugene, Re. 28,628.

Fuji Photo Film Co., Ltd.: *See—*
Miyatsuka, Hajime, Re. 28,626.

Hamann, Omer F., to Stromberg DatagraphiX, Inc. Data handling system with screen made of fiber optic light pipes containing photochromic material. Re. 28,630, Cl. 178-7.870.

Hartnett, Laurence John: *See—*
Jordan, Donald Alfred; and Hartnett, Laurence John, Re. 28,620.

Hughes Tool Company: *See—*
Cunningham, Robert A., Re. 28,625.

Jordan, Donald Alfred; and Hartnett, Laurence John. Carrying device for medical and veterinary use. Re. 28,620, Cl. 5-82.000.

Lewis, Donald J.; and Bishop, Robert J., to Allied Chemical Corporation. Argon compressed gas supply. Re. 28,624, Cl. 280-150.0AB.

Maher, Philip K.; and McDaniel, Carl V., to W. R. Grace & Co. Ion exchange of crystalline zeolites. Re. 28,629, Cl. 423-112.000.

McDaniel, Carl V.: *See—*
Maher, Philip K.; and McDaniel, Carl V., Re. 28,629.

Miyatsuka, Hajime, to Fuji Photo Film Co., Ltd. Electrophotograhic photosensitive zinc oxide powder mixture. Re. 28,626, Cl. 96-1.800.

Pastoriza, James J., to Analog Devices, Incorporated. Solid state digital-to-analog converter. Re. 28,633, Cl. 340-347.0DA.

Ray, Thomas J.: *See—*
Waehner, Glenn C.; and Ray, Thomas J., Re. 28,631.

Sarkes Tarzian, Inc.: *See—*
Badger, Joe G., Re. 28,632.

Scudder, Kenneth R., to United States of America, Army. Fluid angular rate sensor. Re. 28,621, Cl. 73-505.000.

Scudder, Kenneth R.; Burke, John F.; and Dunn, John L., to United States of America, Army. Fluid angular rate sensor. Re. 28,622, Cl. 73-505.000.

Stetson Ross, Inc.: *See—*
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Stromberg DatagraphiX, Inc.: *See—*
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United Technologies Corporation: *See—*
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W. R. Grace & Co.: *See—*
Maher, Philip K.; and McDaniel, Carl V., Re. 28,629.

Waehner, Glenn C.; and Ray, Thomas J., to United Technologies Corporation. High voltage deflection correction in CRT displays. Re. 28,631, Cl. 315-371.000.

West, Norman Eugene: *See—*
Carlson, Dana Peter; and West, Norman Eugene, Re. 28,628.

Zweig, Arnold: *See—*
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Zaiger, Chris F. Apricot tree. 3,809, 11–25–75. Cl. 39.
Zaiger, Chris F. Cherry tree. 3,810, 11–25–75, Cl. 37.
Zaiger, Chris F. Plum tree. 3,811, 11–25–75, Cl. 38.

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Van Acker, John J., and Rotheiser. 237,830.

Agfa Gevaert AG: *See—*
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Winkler, Alfred, Schlagheck, and Schultes. 237,834.

Alassa, Edouard J. B., to Tradali SA. Bottle 237,776, 11–25–75, Cl. D9—72

Anderson, Harold R. Support for a scoop 237,836, 11–25–75, Cl. D67—3.

Apilado, Tony. Infant nursing bottle. 237,839, 11–25–75, Cl. D83—8.

Batchelor, Norman R. Rug and floor nozzle or the like. 237,772, 11–25–75, Cl. D7—713.

Becker, James R., and S. J. Villano. Game board. 237,809, 11–25–75, Cl. D34—5.

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Bobrick, Mitchell: *See—*
Quin, Murray L., Bobrick, and Buzan. 237,819.

Booth, Kenneth J.: *See—*
Howe, Blair E., and Booth. 237,788.

Brown, Dwight C. Flexible strap fastener and identification band. 237,781, 11–25–75, Cl. D9—252.

Bulgari, Gianni, P., and N. Serpentine watch bracelet. 237,815, 11–25–75, Cl. D45—4.

Bulgari, Gianni, P., and N. Serpentine ring. 237,816, 11–25–75, Cl. D45—10.

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Cannella, Samuel M., to Becker Tool Co., Inc. Securing device. 237,774. 11–25–75, Cl. D8—108.

Cone, Cynthia A. Z. Carriage for bicycles and the like. 237,790, 11–25–75, Cl. D12—114.

Cooper, William W. IV, to Dept. of Health, Education & Welfare. Dialyzer cartridge. 237,837, 11–25–75, Cl. D83—1.

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Di Bartolo, Vincent, to Mele Mfg. Co., Inc. Compartmented jewelry tray for pierced earring. 237,841, 11–25–75, Cl. D87—1.
Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Display support for parallelepipedic packages. 237,766, 11–25–75, Cl. D6—85.
Douneux, Jacques D., to Addressograph-Multigraph Corp. Photo copy machine. 237,829, 11–25–75, Cl. D61—1.
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Ekstrand, Ernest W. Ball game target. 237,808, 11–25–75, Cl. D34—5.
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Genaro, Donald M., T. J. Kelly, J. N. McGarvey, and D. W. Tyler, to Bell Telephone Laboratories, Inc. Videotelephone transceiver. 237,801, 11–25–75, Cl. D26—14.
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Hendry, R. Lynn. Arrow stand. 237,762, 11–25–75, Cl. D6—20.
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Hitomi, Kanji. Tie-down hook for pickup truck. 237,775, 11–25–75, Cl. D8—229.
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Huffman, Erline L. Eye shade with removable crown. 237,758, 11–25–75, Cl. D2—244.
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Johnson, Arthur F., to Humboldt Mfg. Co. Laboratory stand clamp or like article. 237,773, 11–25–75, Cl. D8—72.
Kato, Kosei, to Tomy Kogyo Co., Inc. Toy horizontal bar. 237,812, 11–25–75, Cl. D34—15.
Kelly, Thomas J.: *See*—
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Kizawa, Hisashi. Housing for loudspeakers. 237,804, 11–25–75, Cl. D26—14.
Klaiber, Gerhart F., and D. Foggia, to TIE/communications, Inc. Telephone push-button dial. 237,802, 11–25–75, Cl. D26—14.
Klaiber, Gerhart F., and D. Foggia, to TIE/communications, Inc. Telephone dial button. 237,803, 11–25–75, Cl. D26—14.
Lindsley, Warren F. B.: *See*—
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Lorgues, Rene. Bottle. 237,778, 11–25–75, Cl. D9—159.
Loubier, George R. Clock. 237,783, 11–25–75, Cl. D10—16.
Lucas, Nick. Display container for cookies. 237,779, 11–25–75, Cl. D9—182.
MacDonald, John B., and R. J. Halstead. Television receiver. 237,826, 11–25–75, Cl. D56—4.
McDonald, John W., to Ethyl Development Corp. Bottle or similar article. 237,777, 11–25–75, Cl. D9—105.
Meeker, Paul. Nursing bottle closure shield. 237,838, 11–25–75, Cl. D83—8.
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Neyman, Samuel D. Combination bunk bed and sofa. 237,761, 11–25–75, Cl. D6—40.
Nicol, Ronald, to Heinemann Electric Co. Handle adapter for circuit breakers. 237,800, 11–25–75, Cl. D26—13.
Oropeza, Trinidad B. Hot dish holder. 237,771, 11–25–75, Cl. D7—130.
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Rawson, Paul O. Hair dryer. 237,840, 11–25–75, Cl. D86—10.
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21.2 3,921,329

CLASS 46
16 3,921,330
117 3,921,331
161 3,921,332

CLASS 47
37 3,921,333

CLASS 48
197R 3,922,148

CLASS 49
56 3,921,334
265 3,921,335

CLASS 51
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3,921,337
33W 3,921,338
34J 3,921,339
165R 3,921,340
205WG 3,921,341
209DL 3,921,342
323 3,921,343
395 3,921,344

CLASS 52
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30 3,921,346
36 3,921,347
64 3,921,348
81 3,921,349
180 3,921,350
197 3,921,351
200 3,921,352
223 3,921,353
237 3,921,354
262 3,921,355
299 3,921,356
309 3,921,357
314 3,921,358
616 3,921,359
648 3,921,360
745 3,921,362
747 3,921,361
758A 3,921,363
3,921,365
758F 3,921,364

CLASS 53
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37 3,921,367
47 3,921,368
237 3,921,369
326 3,921,370
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CLASS 55
21 3,922,149
25 3,922,150
92 3,922,151
246 3,922,152
257 3,922,153

CLASS 56
12.8 3,921,372
16.6 3,921,373
208 3,921,374
327R 3,921,375
400 3,921,376

CLASS 57
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59 3,921,378
77.4 3,921,379
140R 3,921,380
156 3,921,381
157TS 3,921,382

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3 3,921,383
23R 3,921,384
3,921,385
28R 3,921,386
85.5 3,921,387
140A 3,922,041

CLASS 59
78.1 3,921,388

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39.27 3,921,390
39.72R 3,921,391
39.74R 3,921,392
39.74S 3,921,393
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282 3,921,395
290 3,921,396
303 3,921,397
310 3,921,398
478 3,921,399
517 3,921,400
521 3,921,401
531 3,921,402
606 3,921,403
618 3,921,404
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45D 3,921,409
53.52 3,921,410

CLASS 62
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54 3,921,412
58 3,922,154
173 3,921,413
188 3,921,414
354 3,921,415
427 3,921,416

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272 3,922,156

CLASS 66
84A 3,921,417
87 3,921,418

CLASS 68
5C 3,921,420
5D 3,921,419
17R 3,921,421

CLASS 70
97 3,921,422
416 3,921,423

CLASS 71
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76 3,922,158
90 3,922,159
3,922,160
92 3,922,161
3,922,162
95 3,922,163

CLASS 72
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4 3,921,425
56 3,921,426
59 3,921,427
185 3,921,428
189 3,921,429
201 3,921,430
289 3,921,431
362 3,921,432
461 3,921,433

CLASS 73
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40 3,921,435
3,921,436
40.5R 3,921,437
40.7 3,921,438
61.1R 3,921,439
67.8S 3,921,440
71.5US 3,921,441
3,921,442
95 3,921,443
114 3,921,444
133R 3,921,445
136R 3,921,446
151 3,921,447
205D 3,921,448
273 3,921,449
295 3,921,450
304C 3,921,451
343.5 3,921,452
361 3,921,453
401 3,921,454
418 3,921,455
421.5R 3,921,456
3,921,457
422R 3,921,458
425.2 3,921,459
425.6 3,921,460
447 3,921,461
482 3,921,462
492 3,921,463
505 Re.28,621
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110 3,921,466
219 3,921,467
240 3,921,468
339 3,921,469
414 3,921,470
523 3,921,471
785 3,921,264

CLASS 75
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36 3,922,165
58 3,922,166
109 3,922,167
171 3,922,168

CLASS 81
9.51 3,921,472
57.34 3,921,473
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119 3,921,475
3,921,476
128 3,921,477
417 3,921,478

CLASS 82
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CLASS 83
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42 3,921,481
185 3,921,482
277 3,921,483
320 3,921,484
342 3,921,485
420 3,921,486
467 3,921,487
505 3,921,488
779 3,921,489
833 3,921,490

CLASS 84
1.01 3,921,491
269 3,921,492
474 3,921,493

CLASS 85
3R 3,921,494
10E 3,921,495
83 3,921,496

CLASS 86
20C 3,921,497

CLASS 89
1.8 3,921,498
12 3,921,499

CLASS 91
4 3,921,500
32 3,921,501
391R 3,921,502
506 3,921,503

CLASS 92
13.4 3,921,504
169 3,921,505

CLASS 93
8VB 3,921,506

CLASS 96
1PE 3,922,169
1.8 Re.28,626
124 3,922,170

CLASS 98
2 3,921,507
33 3,921,508
59 3,921,509

CLASS 100
7 3,921,510
107 3,921,511
117 3,921,512
155 3,921,513
162B 3,921,514
229A 3,921,515

CLASS 101
91 3,921,516
93.09 3,921,517
111 3,921,518
116 3,921,519
120 3,921,520
3,921,521
129 3,921,522
232 3,921,523
329 3,921,524
365 3,921,525
415.1 3,921,526
463 3,921,527

CLASS 102
8 3,921,528
24R 3,921,529
70.2R 3,921,530
78 3,921,531

CLASS 104
130 3,921,532
138R 3,921,533
148SS 3,921,535
202 3,921,536
247 3,921,534

CLASS 105
248 3,921,537
367 3,921,538

CLASS 106
23 3,922,171
104 3,922,172
194 3,922,173

CLASS 108
8 3,921,539
55R 3,921,540

CLASS 109
59 3,921,541

CLASS 110
1R 3,921,542
7B 3,921,543
8F 3,921,544
8R 3,921,545
173B 3,921,546

CLASS 111
1 3,921,547
2 3,921,548

CLASS 112
104 3,921,549
121.12 3,921,550
181 3,921,551
215 3,921,552
228 3,921,553
252 3,921,554

CLASS 113
116W 3,921,555
120R 3,921,556

CLASS 114
.5T 3,921,557
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20 3,921,559
41 3,921,560
165 3,921,561
235B 3,921,562

CLASS 116
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82 3,921,564
114J 3,921,565
115.5 3,921,566
3,921,567
121 3,921,568
129P 3,921,569

CLASS 118
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7 3,921,571
49.1 3,921,572
70 3,921,573
106 3,921,574
322 3,921,575
634 3,921,576
637 3,921,577
3,921,578
3,921,579
3,921,580

CLASS 119
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3,921,582
5 3,921,583
3,921,584
20 3,921,585
3,921,586
78 3,921,587
82 3,921,588
121 3,921,589

CLASS 122
4D 3,921,590
34 3,921,591
262 3,921,592

CLASS 123
8.01 3,921,593
8.05 3,921,594
8.23 3,921,595
8.27 3,921,596
8.31 3,921,597
25A 3,921,599
41.33 3,921,603
41.54 3,921,600
44D 3,921,602
44E 3,921,601
69R 3,921,608
90.55 3,921,609
117R 3,921,610
119A 3,921,611
119R 3,921,612
139E 3,921,604
143B 3,921,605
148E 3,921,606
179BG 3,921,613
191S 3,921,607

CLASS 124
24R 3,921,598
30R 3,921,614

35A 3,921,615
CLASS 125
11CD 3,921,616
CLASS 126
21R 3,921,617
120 3,921,618
140 3,921,619
CLASS 128
1.3 3,921,620
2H 3,921,621
2V 3,921,622
2.05P 3,921,623
2.06F 3,921,624
63 3,921,625
75 3,921,626
132D 3,921,627
145.6 3,921,628
156 3,921,629
214R 3,921,630
214.4 3,921,631
217 3,921,632
218R 3,921,633
227 3,921,634
229 3,921,635
260 3,921,636
266 3,921,637
287 3,921,638
3,921,639
318 3,921,640
321 3,921,641
419PG 3,921,642
CLASS 130
24 3,921,643
CLASS 131
21B 3,921,644
182 3,921,645
238 3,921,646
CLASS 132
9 3,921,647
37R 3,921,648
84D 3,921,649
88.7 3,921,650
CLASS 134
57DL 3,921,651
58R 3,921,652
102 3,921,653
167R 3,921,654
CLASS 135
20R 3,921,655
CLASS 136
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6LN 3,922,174
6A 3,922,175
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133 3,922,178
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75 3,921,657
98 3,921,658
3,921,659
236 3,921,660
356 3,921,661
517 3,921,662
533.11 3,921,663
553 3,921,664
3,921,665
557 3,921,666
624.15 3,921,667
625.24 3,921,669
625.3 3,921,668
625.65 3,921,670
807 3,921,671
CLASS 138
42 3,921,672
109 3,921,673
130 3,921,674
CLASS 139
1C 3,921,675
110 3,921,676
122H 3,921,677
122 3,921,678
384 3,921,679
CLASS 140
58 3,921,680
CLASS 141
71 3,921,681
128 3,921,682
270 3,921,683
279 3,921,684
310 3,921,685
CLASS 148
6.3 3,922,179
11.5R 3,922,180
15 3,922,181
31.5 3,922,183
32 3,922,182
CLASS 151
21C 3,921,686
41.73 3,921,687
CLASS 152
330C 3,921,688

347 3,921,689
354 3,921,690
359 3,921,691
361FP 3,921,692
362R 3,921,693
CLASS 156
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57 3,922,185
310 3,922,186
415 3,922,187
416 3,922,188
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CLASS 159
4A 3,922,189
CLASS 160
166A 3,921,694
176 3,921,695
330 3,921,696
CLASS 162
352 3,922,190
383 3,922,191
CLASS 164
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52 3,921,698
3,921,699
57 3,921,700
98 3,921,701
112 3,921,702
252 3,921,703
259 3,921,704
269 3,921,705
274 3,921,706
305 3,921,707
CLASS 165
84 3,921,708
88 3,921,709
105 3,921,710
109 3,921,711
165 3,921,712
167 3,921,713
CLASS 166
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271 3,921,715
3,921,716
292 3,921,717
307 3,921,718
315 3,921,719
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4 3,921,721
CLASS 169
9 3,921,722
CLASS 171
14 3,921,723
117 3,921,724
CLASS 172
375 3,921,725
646 3,921,726
708 3,921,727
745 3,921,728
CLASS 173
14 3,921,729
46 3,921,730
57 3,921,731
CLASS 174
5R 3,922,476
18 3,922,477
53 3,922,478
68.5 3,922,479
72R 3,922,480
146 3,922,481
CLASS 175
50 3,921,732
65 3,921,733
337 3,921,735
364 3,921,734
CLASS 176
19R 3,922,192
CLASS 177
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86 3,921,737
230 3,921,738
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5.1 3,922,482
5.8AF 3,922,483
6 3,922,484
7.6 3,922,485
7.87 Re.28,630
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69R 3,922,487
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2TV 3,922,491
2A 3,922,490
3,922,492
15AP 3,922,493
15AQ 3,922,497
15BS 3,922,496
15BV 3,922,494

15BY 3,922,495
17A 3,922,498
18GE 3,922,499
84VF 3,922,500
115.5PV 3,922,502
3,922,503
3,922,504
115.5R 3,922,501
170.2 3,922,505
175.1A 3,922,506
175.3R 3,922,507
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9.2C 3,921,743
13 3,921,744
26R 3,921,740
33C 3,921,745
34 3,921,741
50 3,921,742
53R 3,921,746
78 3,921,747
79.2R 3,921,748
98 3,921,749
103 3,921,750
108 3,921,751
125 3,921,752
127 3,921,753
CLASS 181
35R 3,921,754
122 3,921,755
135 3,921,756
CLASS 182
48 3,921,757
67 3,921,758
CLASS 184
1.5 3,921,759
7E 3,921,760
CLASS 185
39 3,921,761
CLASS 187
8.75 3,921,762
52LC 3,921,763
CLASS 188
24 3,921,764
79.5K 3,921,765
167 3,921,766
345 3,921,767
CLASS 190
26 3,921,768
CLASS 191
12R 3,921,769
CLASS 192
12BA 3,921,771
12D 3,921,770
58B 3,921,772
83 3,921,773
85CA 3,921,774
98 3,921,775
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107C 3,921,777
113B 3,921,778
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1L 3,921,779
CLASS 195
28N 3,922,193
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31F 3,922,201
31R 3,922,196
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3,922,198
3,922,199
3,922,200
80R 3,922,202
103.5 3,922,203
CLASS 197
1R 3,921,780
6.7 3,921,781
18 3,921,782
36 3,921,783
53 3,921,787
54 3,921,784
CLASS 198
8 3,921,785
19 3,921,788
31AB 3,921,789
37 3,921,790
38 3,921,786
165 3,921,791
189 3,921,792
208 3,921,793
215 3,921,794
256 3,921,795
266 3,921,796
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11R 3,922,509
76 3,922,510
83S 3,922,515
84C 3,922,511
148F 3,922,512

159R 3,922,513
246 3,922,514
CLASS 204
1T 3,922,204
3,922,205
6 3,922,206
16 3,922,207
3,922,208
43T 3,922,209
99 3,922,210
140 3,922,211
159.2 Re.28,628
181 3,922,212
3,922,213
290F 3,922,226
298 3,922,214
CLASS 206
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53 3,921,798
83.5 3,921,799
219 3,921,800
223 3,921,801
225 3,921,802
389 3,921,803
531 3,921,804
532 3,921,805
534 3,921,806
544 3,921,807
CLASS 208
11 3,922,215
73 3,922,216
299 3,922,217
310 3,922,218
CLASS 209
74R 3,921,808
98 3,921,809
167 3,921,810
223A 3,922,219
CLASS 210
23 3,922,220
50 3,922,221
71 3,922,222
198C 3,922,223
223 3,922,224
242 3,922,225
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43 3,921,811
60T 3,921,812
131 3,921,813
162 3,921,814
CLASS 212
3 3,921,815
27 3,921,816
66 3,921,817
132 3,921,818
144 3,921,819
CLASS 214
1BB 3,921,820
3,921,822
1BH 3,921,821
2.5 3,921,823
5.5 3,921,824
6FA 3,921,826
6FS 3,921,827
6P 3,921,825
16.4C 3,921,828
17CB 3,921,829
23 3,921,830
35R 3,921,831
82 3,921,832
130C 3,921,833
132 3,921,834
138R 3,921,835
142 3,921,836
145 3,921,837
152 3,921,838
302 3,921,839
310 3,921,840
339 3,921,841
450 3,921,842
514 Re.28,623
516 3,921,843
CLASS 215
13R 3,921,844
320 3,921,845
CLASS 217
65 3,921,846
CLASS 219
61 3,922,517
69M 3,922,518
76 3,922,516
3,922,519
216 3,922,520
222 3,922,521
494 3,922,527
523 3,922,528
CLASS 220
64 3,921,847
67 3,921,848
295 3,921,849
308 3,921,850

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151 3,921,851
266 3,921,852
CLASS 222
1 3,921,853
16 3,921,854
67 3,921,855
132 3,921,856
145 3,921,857
146HE 3,921,858
204 3,921,859
207 3,921,860
257 3,921,861
305 3,921,862
370 3,921,863
386 3,921,864
447 3,921,865
512 3,921,866
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32A 3,921,868
42.03B 3,921,869
42.07 3,921,870
45R 3,921,872
45S 3,921,871
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2 3,921,873
4 3,921,874
CLASS 226
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43 3,921,877
91 3,921,878
148 3,921,879
181 3,921,880
194 3,921,881
196 3,921,882
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17.5 3,921,883
44.1 3,921,884
116 3,921,885
117 3,921,886
155 3,921,887
180 3,921,888
CLASS 229
7S 3,921,889
14C 3,921,890
15 3,921,891
17B 3,921,892
23R 3,921,893
27 3,921,894
39B 3,921,895
39R 3,921,896
41R 3,921,897
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23A 3,921,898
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61.11R 3,922,530
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92T 3,922,531
150.27 3,922,533
150.3 3,922,532
151.1 3,922,535
151.32 3,922,534
152 3,922,526
3,922,536
153AC 3,922,537
156 3,922,538
183 3,922,539
193.5 3,922,540
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9A 3,921,899
93 3,921,900
CLASS 239
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17 3,921,902
24 3,921,903
70 3,921,904
110 3,921,905
127.3 3,921,906
172 3,921,907
177 3,921,908
3,921,909
205 3,921,910
206 3,921,911
242 3,921,912
553 3,921,913
567 3,921,914
589 3,921,915
601 3,921,916
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28 3,921,918
56 3,921,919
159 3,921,920
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18A 3,921,922
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26.1 3,921,924
47.12 3,921,925
55.2 3,921,936

56.9 3,921,926
74 3,921,927
75.43 3,921,928
76 3,921,929
107.4 3,921,930
3,921,931
130.2 3,921,932
192 3,921,933
194 3,921,934
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17.11 3,921,938
17.25 3,921,939
17.27 3,921,940
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169R 3,921,945
182A 3,921,946
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169 3,921,947
221 3,921,949
223 3,921,948
313 3,921,950
373 3,921,951
404 3,921,952
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62 3,921,953
88 3,921,954
CLASS 250
216 3,922,522
231R 3,922,525
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291 3,922,543
296 3,922,544
303 3,922,545
310 3,922,546
315A 3,922,547
320 3,922,523
324 3,922,548
330 3,922,524
3,922,549
338 3,922,550
343 3,922,551
369 3,922,552
370 3,922,553
461 3,922,554
472 3,922,555
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	3,921,270	3,921,654	3,922,362	3,921,807	3,922,602	3,921,834
	3,921,290	3,921,667	3,922,413	3,921,860	3,922,630	3,921,840
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	3,921,410	3,921,869	3,922,577	3,922,589	3,921,905	3,922,215
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18 : Re.28,632
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54 : Re.28,628
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55 : 3,921,345	3,921,569	3,921,634	3,922,026	3,922,429	56 : 3,921,740

DESIGN PATENTS

4 : 237,771	237,840	25 : 237,837	237,801	39 : 237,772	48 : 237,784
237,780	10 : 237,769	237,842	237,802	237,830	237,790
6 : 237,757	12 : 237,817	26 : 237,758	237,803	237,838	237,792
237,765	16 : 237,762	237,785	237,841	40 : 237,760	237,805
237,775	17 : 237,763	237,786	36 : 237,789	237,794	237,813
237,788	237,773	27 : 237,836	237,795	41 : 237,798	51 : 237,781
237,808	237,782	29 : 237,777	237,809	42 : 237,807	237,826
237,811	237,797	31 : 237,818	237,827	44 : 237,768	53 : 237,779
237,819	237,814	34 : 237,774	237,835	46 : 237,787	55 : 237,767
237,824	20 : 237,759	237,800	237,839	47 : 237,761	237,810
9 : 237,783					

PLANT PATENTS

6 3,808	3,809	3,810	3,811		

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*